

# Tutorial: Case study on E-R diagram

# E-R Diagram

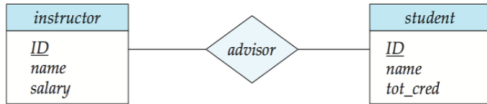
**Entity:** An entity is a “thing” or “object” in the real world that is distinguishable from all other objects.

- An entity is represented by a set of attributes
- An entity set is a set of entities of the same type that share the same properties, or attributes.

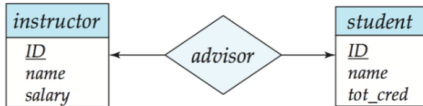
**Relationship:** A relationship is an association among several entities.

- A relationship set is a set of relationships of the same type.

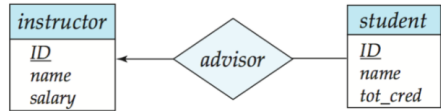
# Mapping Constraints



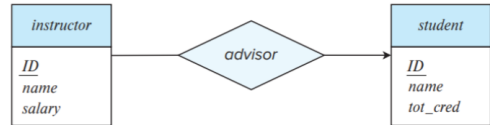
many-to-many relationship



one-to-one relationship



one-to-many relationship



many-to-one relationship

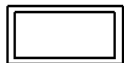


Total and Partial Participation

# E-R diagrams symbols



entity class



weak entity class



relationship type



identifying relationship type



attribute



key attribute



discriminator (partial key) attribute



derived attribute



multivalued attribute



composite attribute

# Steps to draw E-R diagram

- ① Identify the Entities in ER diagram
- ② Add attributes to each Entity
- ③ Identify the Relationships between Entities
- ④ Add Cardinality to every Relationship

# Case Study

Case Study: The Prescriptions-R-X chain of pharmacies has offered to give you and your two neighbors a free lifetime supply of medicine if you design its database. Given the rising cost of health care, you agree. Here are the requirements:

## Requirements

- Patients are identified by an SSN, and their names, addresses, and ages must be recorded.
- Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded.
- Every patient has a primary physician. Every doctor has at least one patient.
- Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors.
- Each prescription has a date and a quantity associated with it. You can assume that if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.
- Each pharmaceutical company is identified by name and has a phone number.
- For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer.
- Each pharmacy has a name, address, and phone number.
- Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract.
- Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.
- Each pharmacy sells several drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.