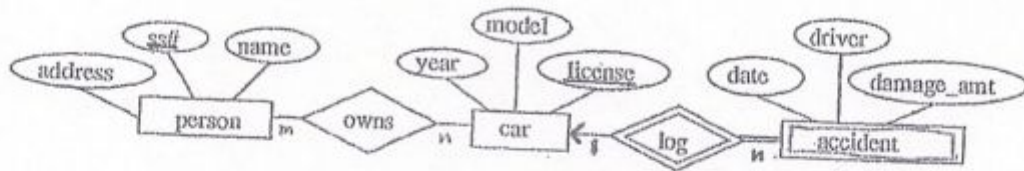
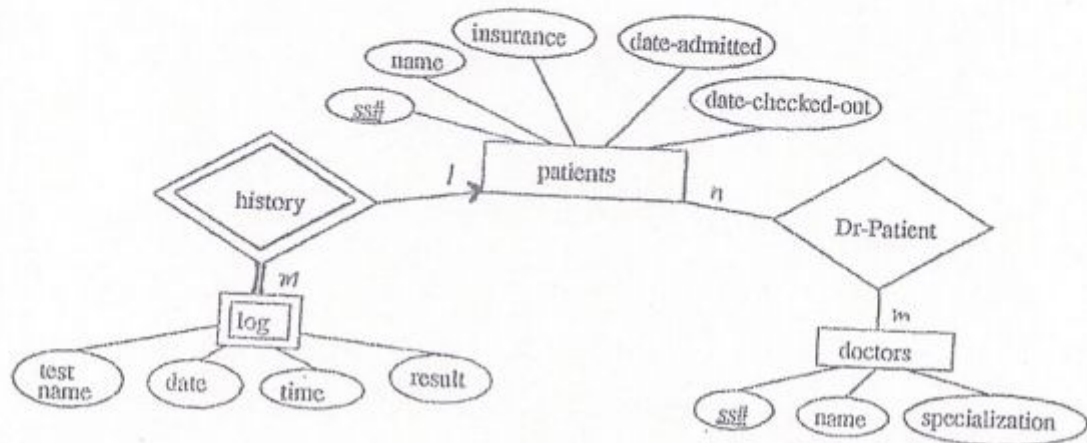


2. Answer:



3. Answer:



Taken from Tut1

Steps to create an ER diagram:

- Find all the entities (rectangles) and possible attributes (in oval), underline primary key(s)
- See if the entity is a weak entity (a weak entity must connect to another entity for it to be unique, e.g. an accident must involve at least a car, cannot exist without a car)
- Name the connection between entities (rhombus)
- If weak entity must add arrow to the entity that it relies to (e.g. accident -> car)
- Add multiplicity to the relationship (person owns n car, car can be owned by m persons, one car can involve in n accidents, accident can only refer to 1 car)

For Exercise 2:

Construct an ER diagram for a car insurance company with a set of **customers**, each of whom **owns** a number of **cars**. Each car has a number of recorded **accidents** associated with it.

- **Find all the entities (rectangles) and possible attributes (in oval), underline primary key(s)**
Person [customerId, name],
Car [license, brand, model, year ...],
Accident [date, driver, damage_amount] *weak entity*
- **Name the connection between entities (rhombus)**
Person owns car
Accident relates/associates to car (logs accident... no absolute correct ans)
- **If weak entity must add arrow to the entity that it relies to (e.g. accident -> car)**
- **Add multiplicity to the relationship**
person owns n car, car can be owned by m persons
one car can involve in n accidents, accident can only refer to 1 car

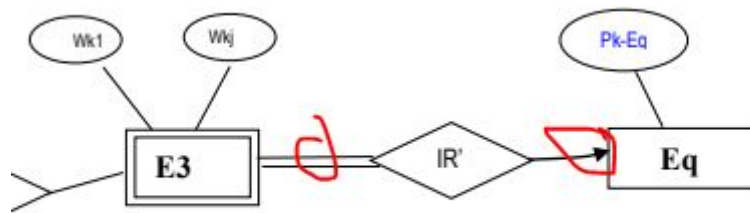
For exercise 3:

Construct an ER diagram for a hospital with a set of patients and a set of medical doctors. A log of the various conducted tests is associated with each patient.

- **Find all the entities (rectangles) and possible attributes (in oval), underline primary key(s)**
Patient [patientId, name, history ...]
Doctors [DoctorId, name, speciality, department ...]
TestLog [date, test_type, result]
- **Name the connection between entities (rhombus)**
Patient associates TestLog
Patient consults Doctor
- **If weak entity must add arrow to the entity that it relies to**
TestLog -> Patient
- **Add multiplicity to the relationship**
Patient associates n testLog, testLog relates 1 patient
Patient consults n Doctor, Doctor relates to m patient (many to many)

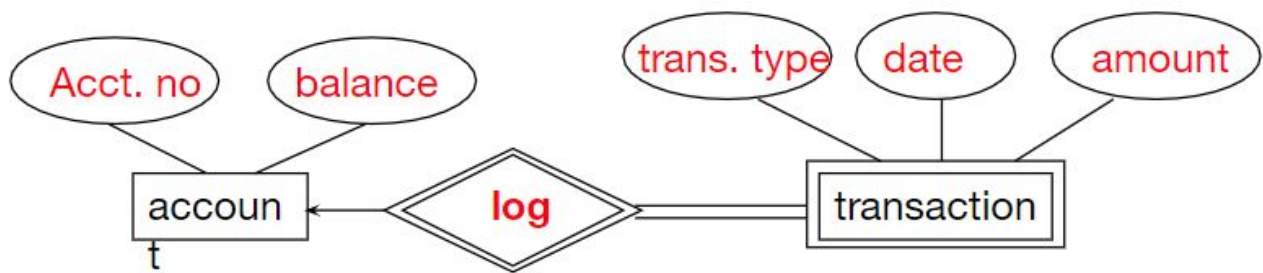
Notes:

MUST use arrow for weak entity connection, also use double line



TestLog == < associates > ----> Patient

More examples from lecture notes



• Role Indicators

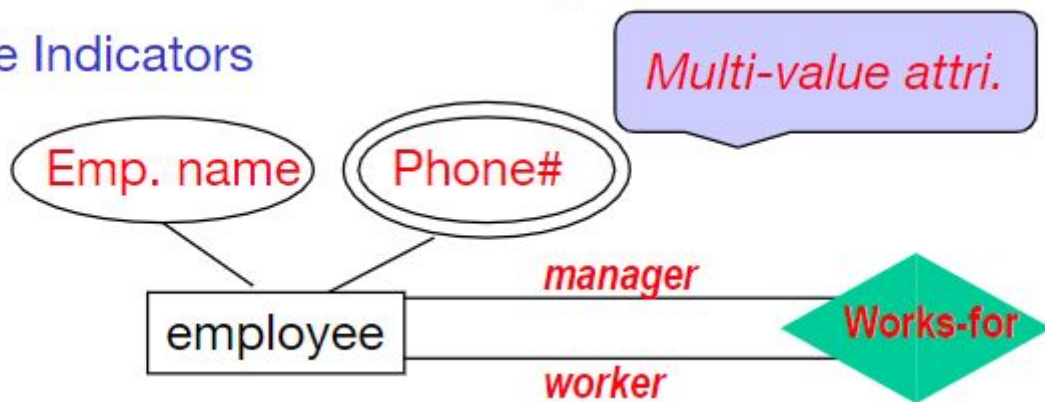


Figure 3.21

An ER diagram for a BANK database schema.

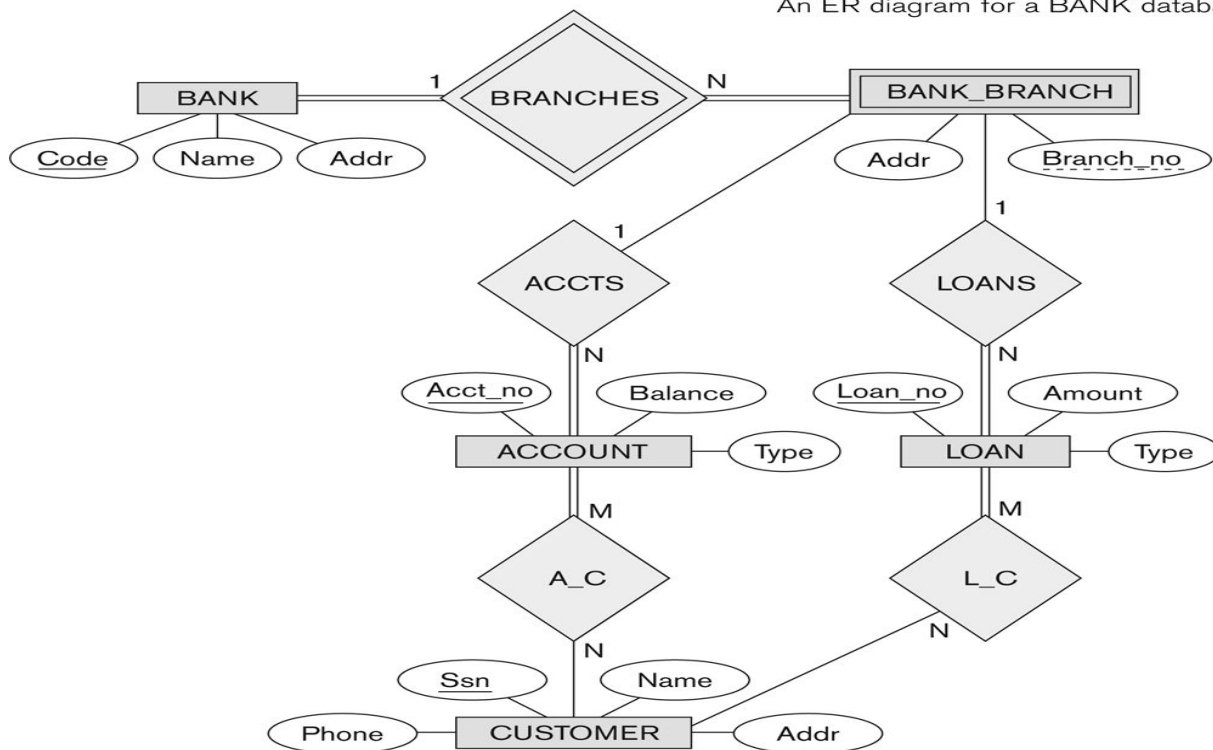
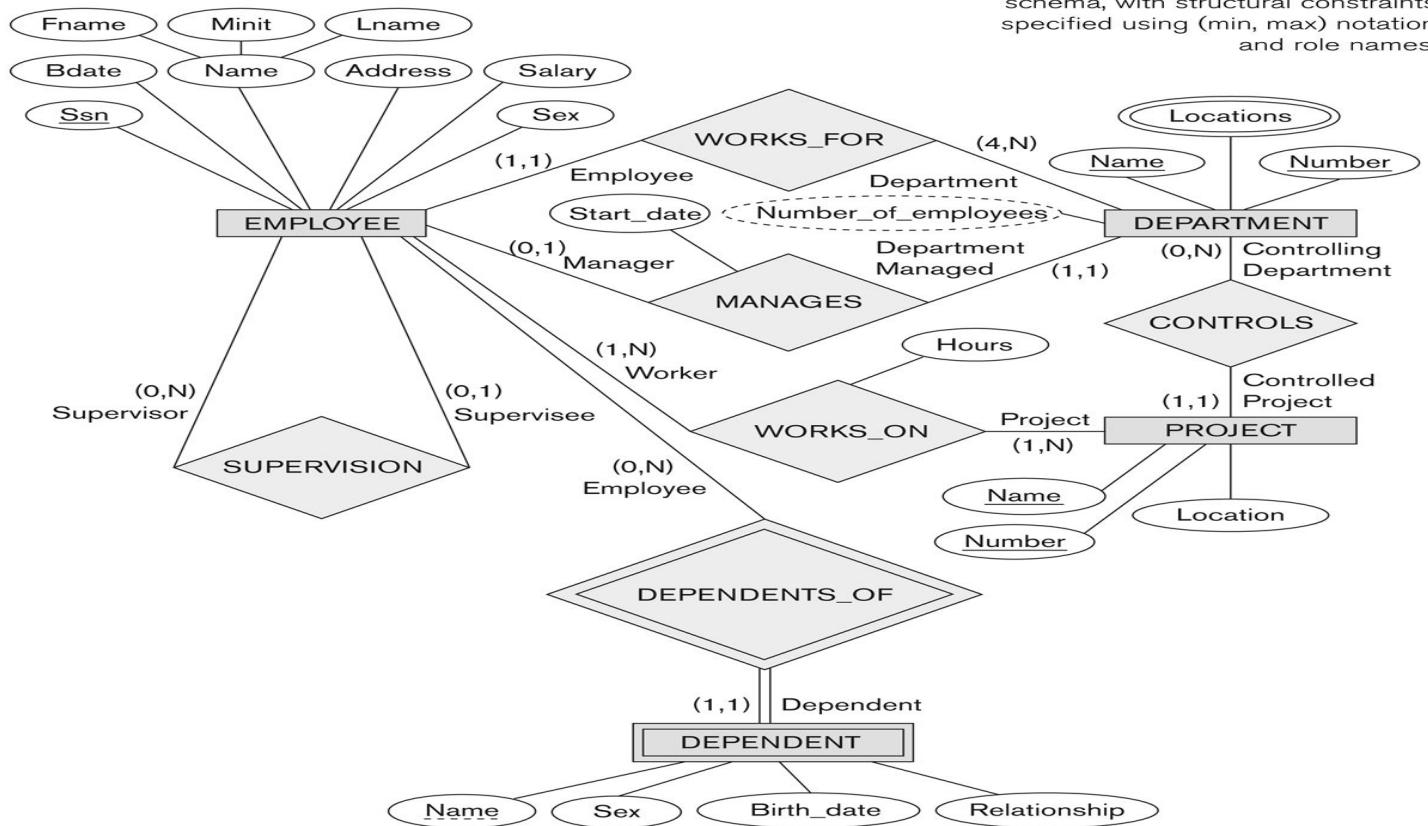


Figure 3.15

ER diagrams for the company schema, with structural constraints specified using (min, max) notation and role names.



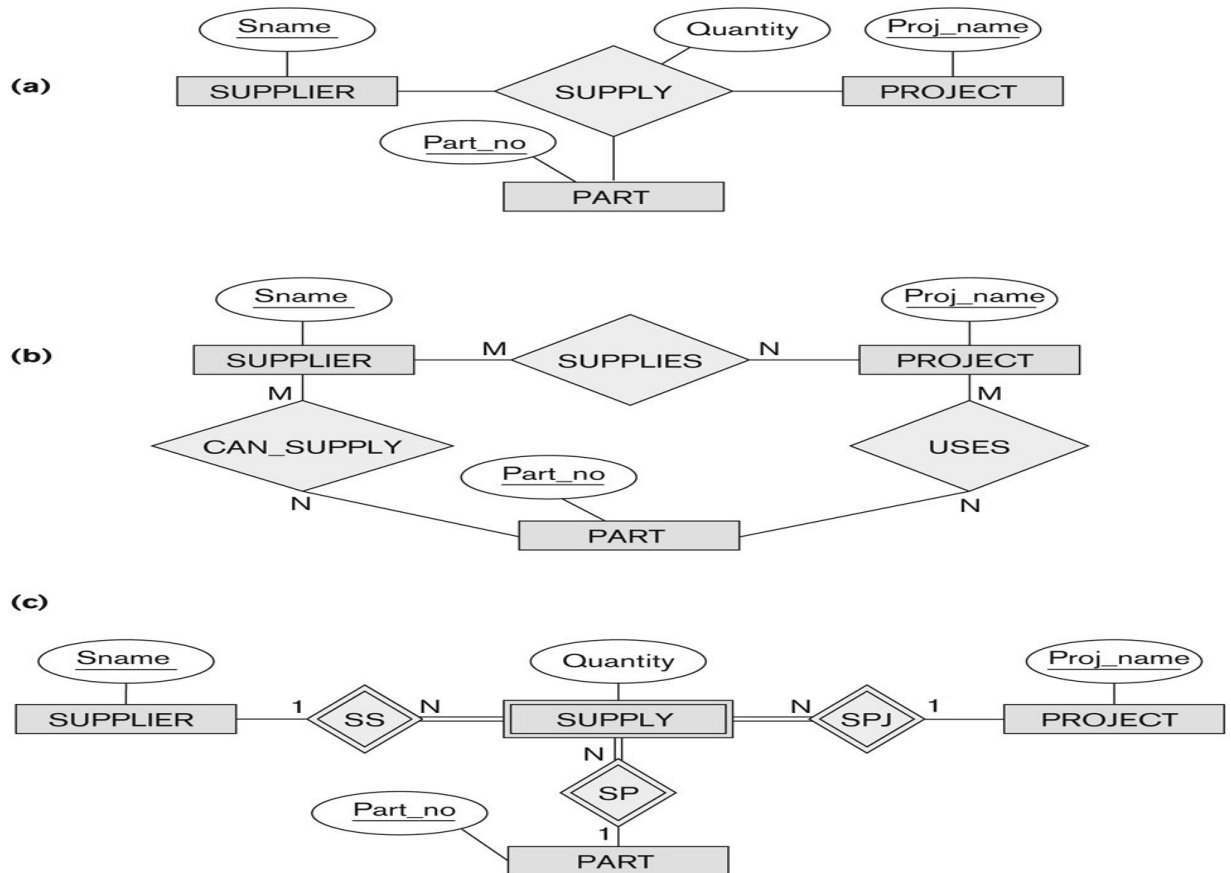
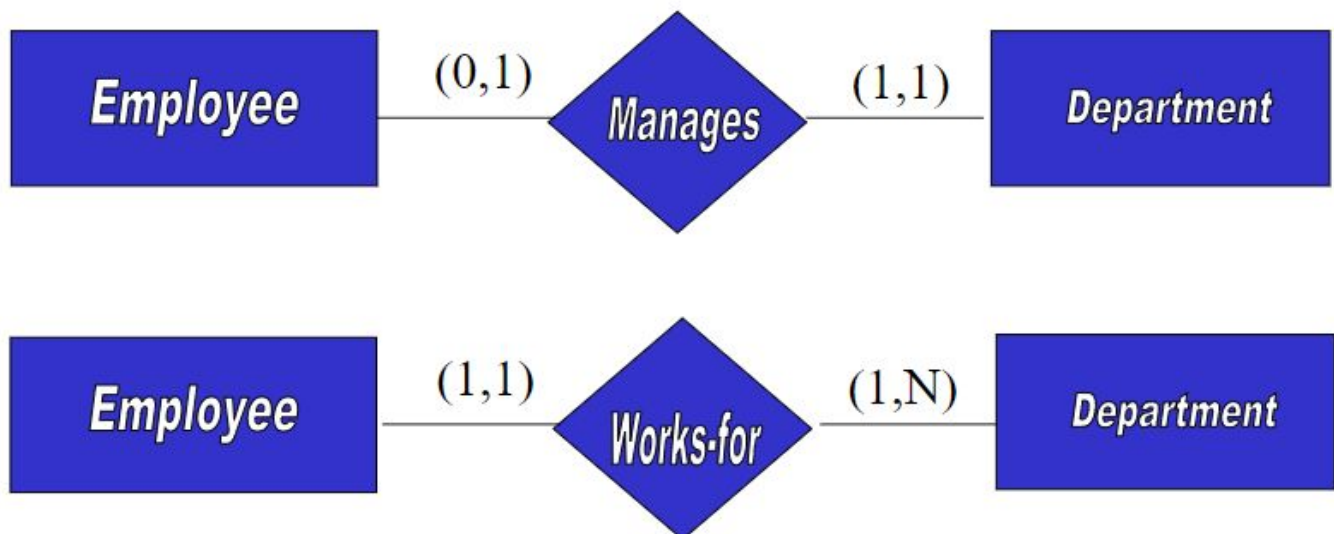


Figure 3.17











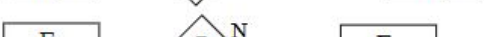

Ternary relationship types. (a) The SUPPLY relationship. (b) Three binary relationships not equivalent to SUPPLY. (c) SUPPLY represented as a weak entity type.



The (min,max) notation “looks away” from the entity!

For example, one employee manages at least 0 at most 1 department

Summary of ER-Diagram Notation

Symbol	Meaning
	ENTITY TYPE
	WEAK ENTITY TYPE
	RELATIONSHIP TYPE
	IDENTIFYING RELATIONSHIP TYPE
	ATTRIBUTE
	KEY ATTRIBUTE
	MULTIVALUED ATTRIBUTE
	COMPOSITE ATTRIBUTE
	DERIVED ATTRIBUTE
	TOTAL PARTICIPATION OF E_2 IN R
	CARDINALITY RATIO 1:N FOR $E_1:E_2$ IN R
	STRUCTURAL CONSTRAINT (min, max) ON PARTICIPATION OF E IN R