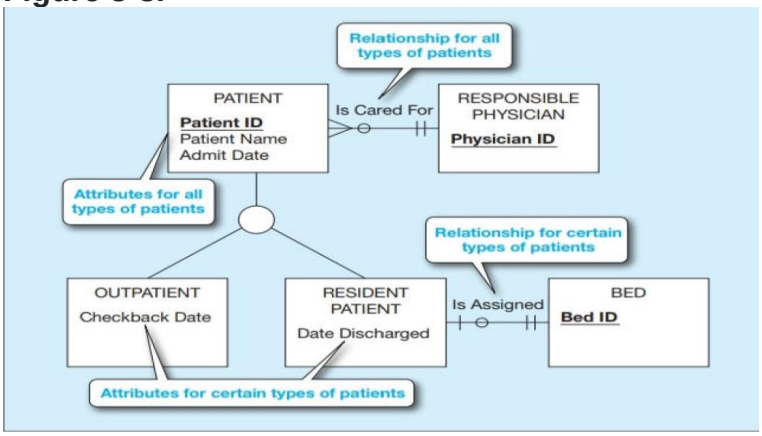
LAKSHMI KUMAR
002887298

DATA MANAGEMENT AND DATABASE DESIGN
HOMEWORK: WEEK- 3

3-22.
Figure 3-3.



Sol:

Here,

- Patient is the **SUPERTYPE**
- Outpatient and Resident Patients are the **SUBTYPES**
- Responsible physician is the relationship in which **ALL INSTANCES** participate. In this case (Patient – Outpatient and Resident Patient)
- Bed is the relationship in which only **SPECIALIZED VERSIONS** participate. In this case (Resident Patient)

ENTITY TYPES AND ATTRIBUTES:
The following are the attributes as shown in fig 3-3

- Patient (A person who is receiving medical attention)
- Responsible Physician (A person who is treating a patient)
- Outpatient (A person who will check-in and check-out the same day)
- Resident Patient (A person who receives medical attention inside the hospital for one or more days)
- Bed (Allocation for a patient that is being treated inside the hospital)

Here, the **SUPERTYPE/PRIMARY** entity **Patient** has two **SUBTYPES** namely **Outpatient and Resident Patient**.
Attributes of the **Primary Entity: Patient** are as follows:

- ➔ Patient ID (This attribute tells us the ID of the patient which is also the foreign key)
- ➔ Patient Name (This attribute tells us the name of the patient)
- ➔ Admit Date (This attribute tells us the date the patient has been admitted)

The **Subtypes: Outpatient and Resident** Patient have one attribute each.

- ➔ Outpatient has a checkback date (This attribute refers to the date when the patient has to return to the hospital for a checkup, post treatment)
- ➔ Resident Patient has a Date Discharged (This attribute refers to the date when the patient has been discharged post treatment and observation)

RELATIONSHIPS:

- ➔ The entity **Responsible** Physician has on attribute namely **Physical ID** which is the key identifier associated with the Physician that has been allocated for a patient
- ➔ The entity **Bed** has one attribute namely **Bed ID** which is the key identifier associated with the Bed that has been allocated for a patient.

Two relationships are defined in the above shown figure (Fig 3-3)

1) **Patient – Responsible Physician**

The relationship is as follows:

- ➔ One patient should mandatorily be assigned a physician
- ➔ One physician can be allotted to any number of patients

2) **Resident Patient – Bed**

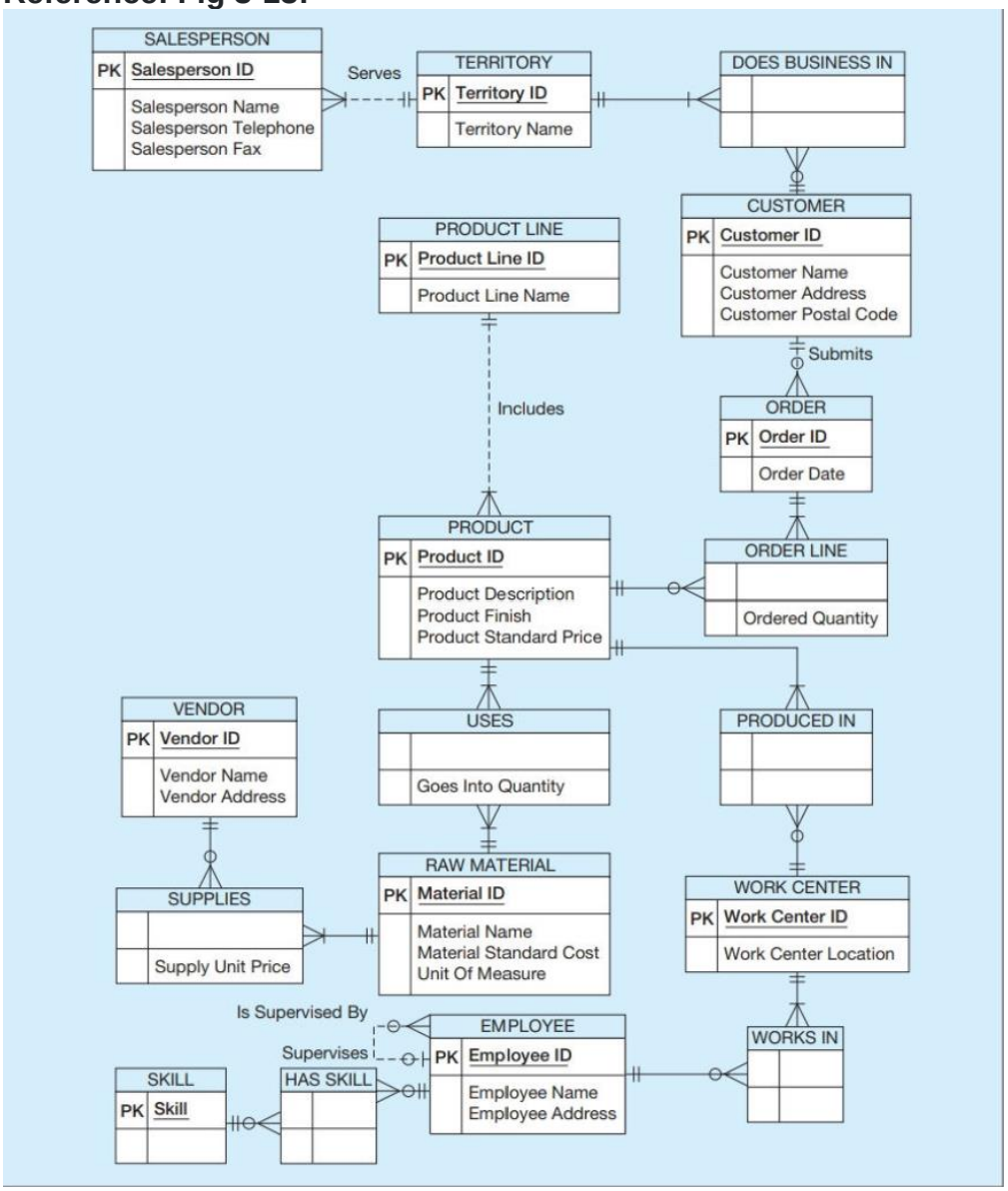
The relationship is as follows:

- ➔ One resident patient must be mandatorily assigned one bed
- ➔ A bed may or may not be assigned. (i.e.) It might be occupied or empty

LAKSHMI KUMAR
002887298

3-23.

Reference: Fig 3-13:



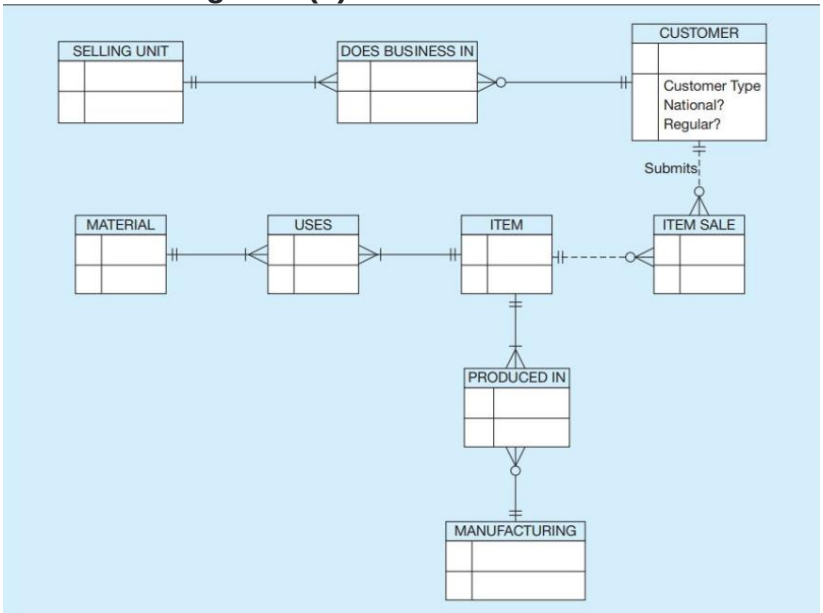
SOL:

a.

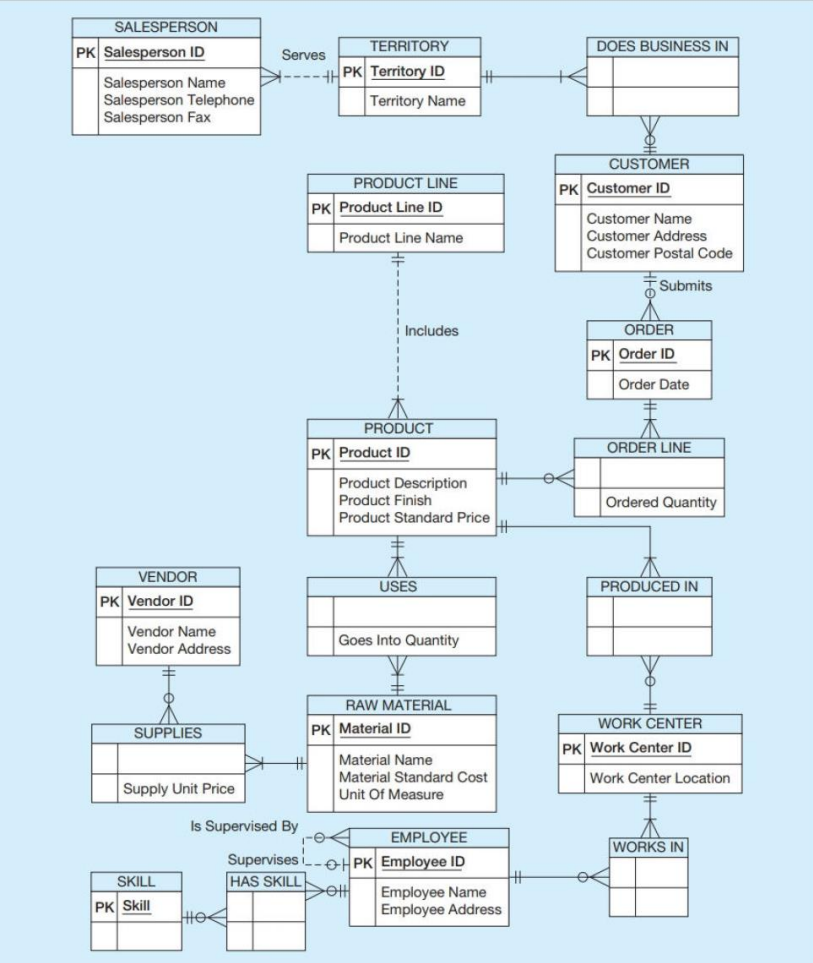
DOES BUSINESS IN is an Associative entity (i.e.) A weak entity.
The association between DOES BUSINESS IN and CUSTOMER is zero because this data does not have to be seen. In this case the Customer type embedded in Business (i.e.) National or Regular does not have to be showcased.
This would have been formed by abstracting a supertype and its subtype, where Customer would be the super type and National or Regular would be the Subtype.

LAKSHMI KUMAR
002887298

Reference: Fig 3-13 (b):



Reference: Fig 2-22



LAKSHMI KUMAR
002887298

b.
Attributes for the entity “Item” are as follows:

- Item ID (Primary Key) - An ID associated with the item
- Item Name – Name associated with item
- Date of manufacturing – Shows the date on which the product has been manufactured.
- Category – Shows which category of products the items belong to

c.
Attributes for the entity “Material” are as follows:

- Material ID (Primary Key) – An ID associated with the material
- Material Name – A name associated with the Material
- Cost per unit – Represents how much the materials costs per unit
- Required quantity – Takes note of how much quantity of the material is required.

3-24.

Sol:
To represent the Enhance Entity-Relationship diagram for the given situation, consider the following Entities:

ENTITIES:

a) Person
b) Site
c) Group
d) Public Site
e) Private Site

According to the criteria mentioned in Part F of 2-44, Entities will have the following attributes:

ATTRIBUTES:

Person:	**Site:**	**Group:**	**Private Site:**	**Public Site:**
Person ID	Site ID	Group ID	Inherits all attributes from Site	Inherits all attributes from Site
First Name	Site Name	Name	Invite Code	
Last Name	URL	Date Created	Admin ID	
Email ID		Date Terminated		
Username		Purpose		
Password		Number of members		

- ➔ Here, Date terminated (Could be Null since the group could still be active)
- ➔ Private site adds two more attributes apart from the ones it inherits from Site –

a) **Invite Code:** This is required because the admin has to invite a person belonging to a group to be a part of the site
b) **Admin ID:** This is required because only the person crating the site has admin privileges to the site

DISJOINTNESS AND COMPLETENESS CONSTRAINTS:

- ➔ Here, **Site** is the **SUPERTYPE** (Primary entity) and **Private site and Public site** are the **SUBTYPES.**
- ➔ Between the Supertype and Subtype, the Disjointness constraint is **DISJOINT** and completeness constraint is **TOTAL SPECIALIZATION**.
- ➔ This is because site can either be Public or Private but not both at the same time.

RELATIONSHIP AND CARDINALITY:

PERSON-SITE:

- ➔ One person creates one or more sites
- ➔ One site is created by one person
- ➔ One person is part of one or more sites
- ➔ One site can have one or more people as members

PERSON-GROUP:

- ➔ One person can belong to one or more groups
- ➔ One group can have one or more members

GROUP-SITE:

- ➔ One site can be managed by one group
- ➔ A group can be associated with one or more sites

ENHANCED ENTITY RELATIONSHIP DIAGRAM: