COP 4710: Database Systems
Fall 2007

Chapter 3 – In Class Exercises

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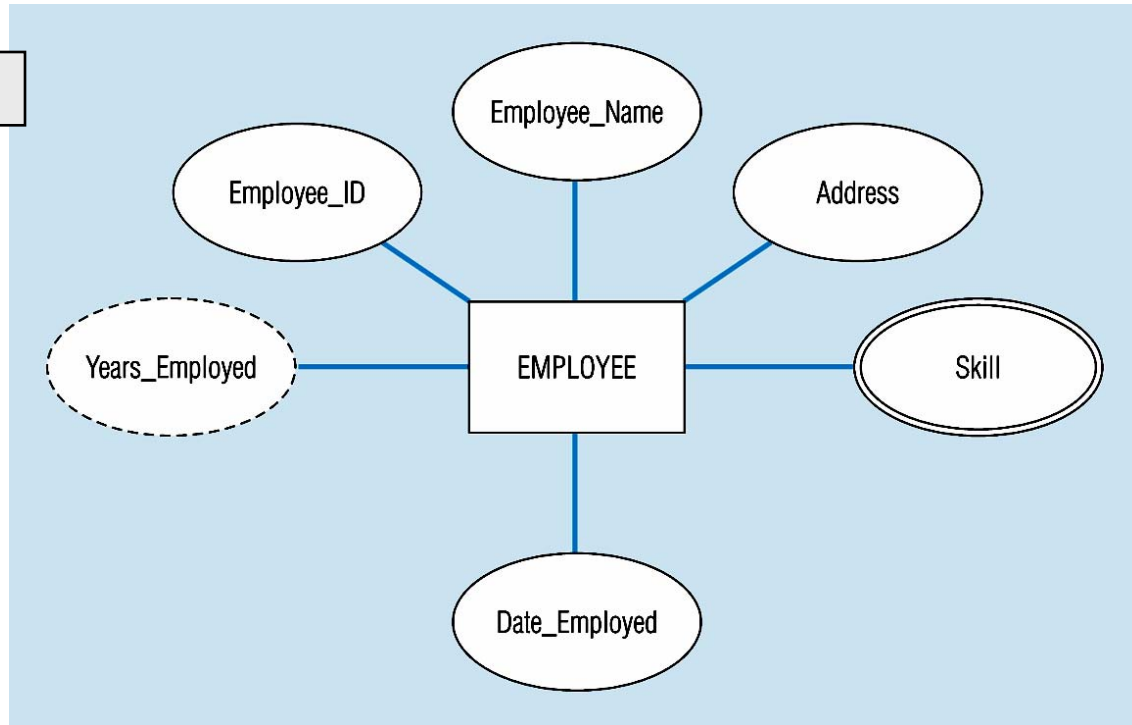   http://www.cs.ucf.edu/courses/cop4710/fall2007

School of Electrical Engineering and Computer Science
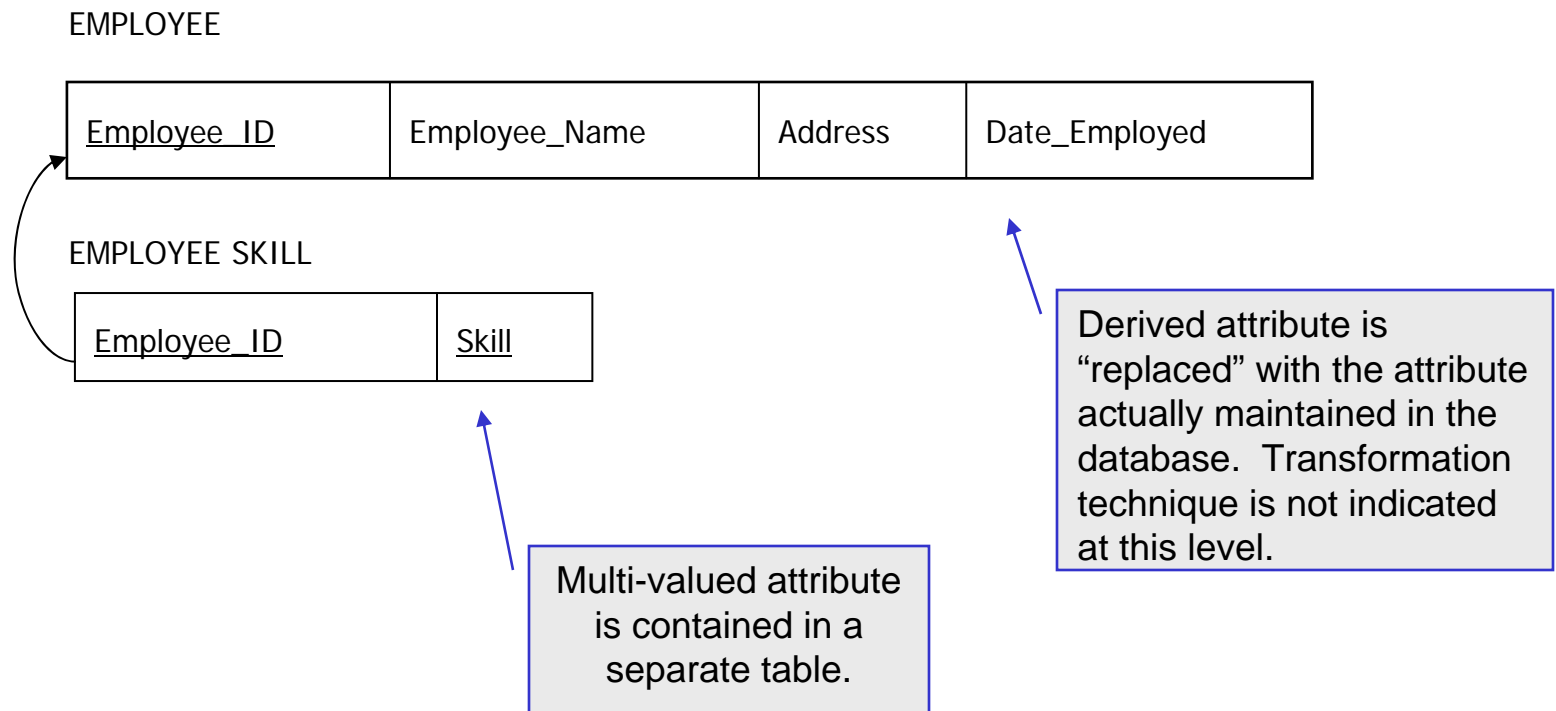University of Central Florida

Introduction

- Transform each of the ER diagrams shown on this and the following few pages, into a set of relational schemas which show referential integrity constraints.
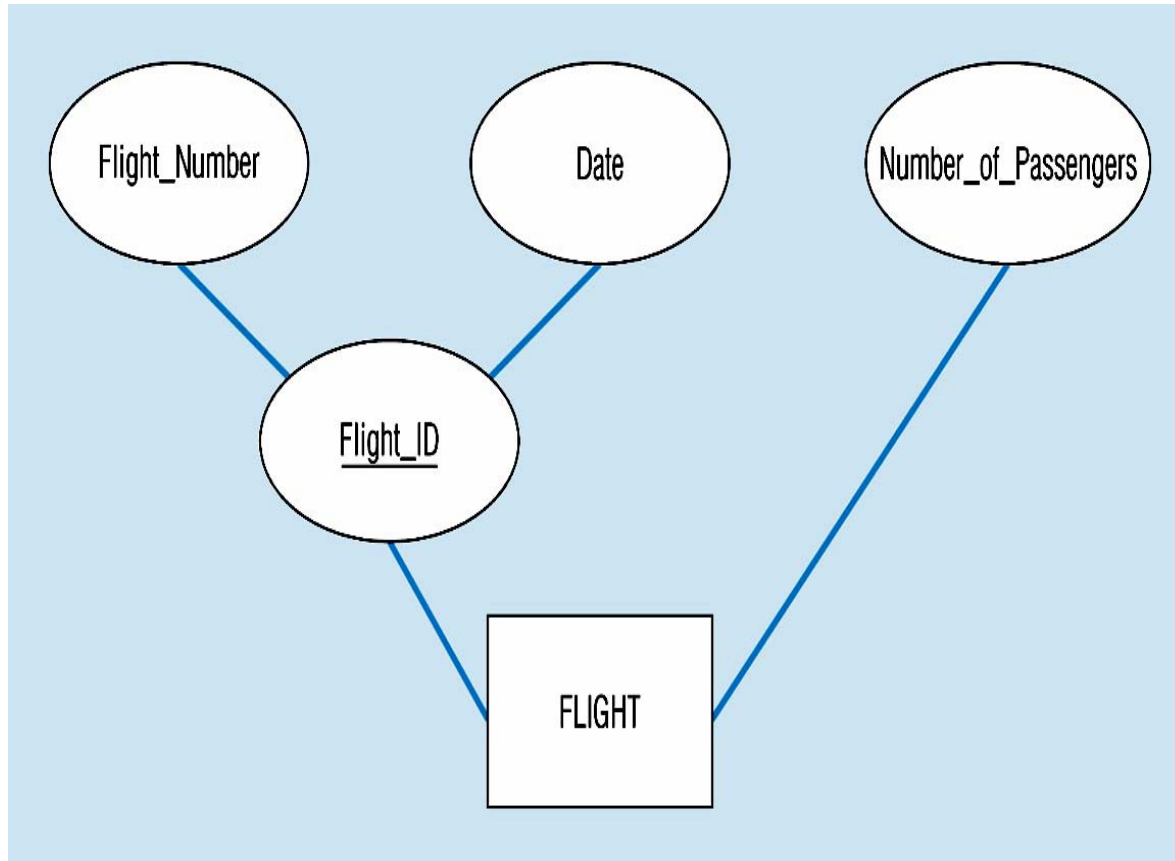

Problem #1

Solution for Problem #1

EMPLOYEE

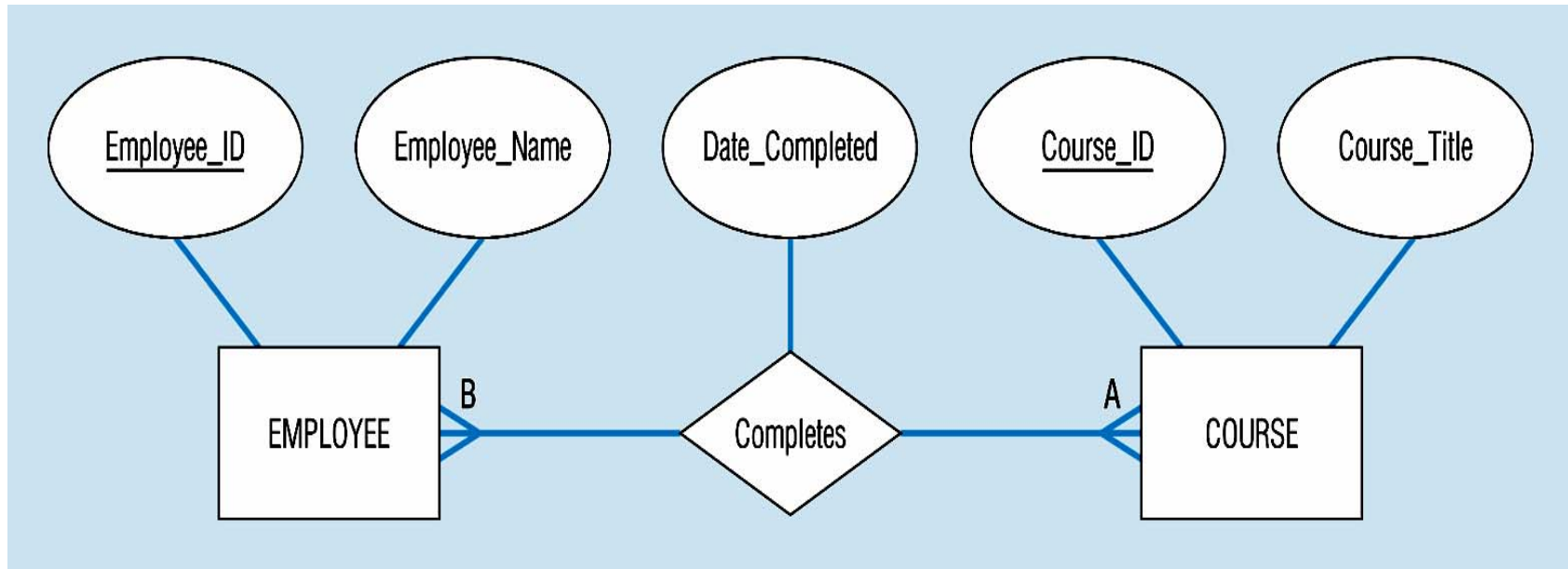| Employee_ID	Employee_Name	Address	Date_Employed

EMPLOYEE SKILL

Employee_ID	Skill

Derived attribute is "replaced" with the attribute actually maintained in the database. Transformation technique is not indicated at this level.

Multi-valued attribute is contained in a separate table.

Problem #2

Solution for Problem #2

FLIGHT

Flight_Number	Date	Number_of_Passengers

Composite attribute Flight_ID is replaced by both of the sub-component attributes of the original composite attribute. Note that since the original composite attribute was a key attribute that all of the sub-component attributes are now key attributes.

Problem #3

Solution for Problem #3

EMPLOYEE

Employee_ID	Employee_Name

COMPLETION

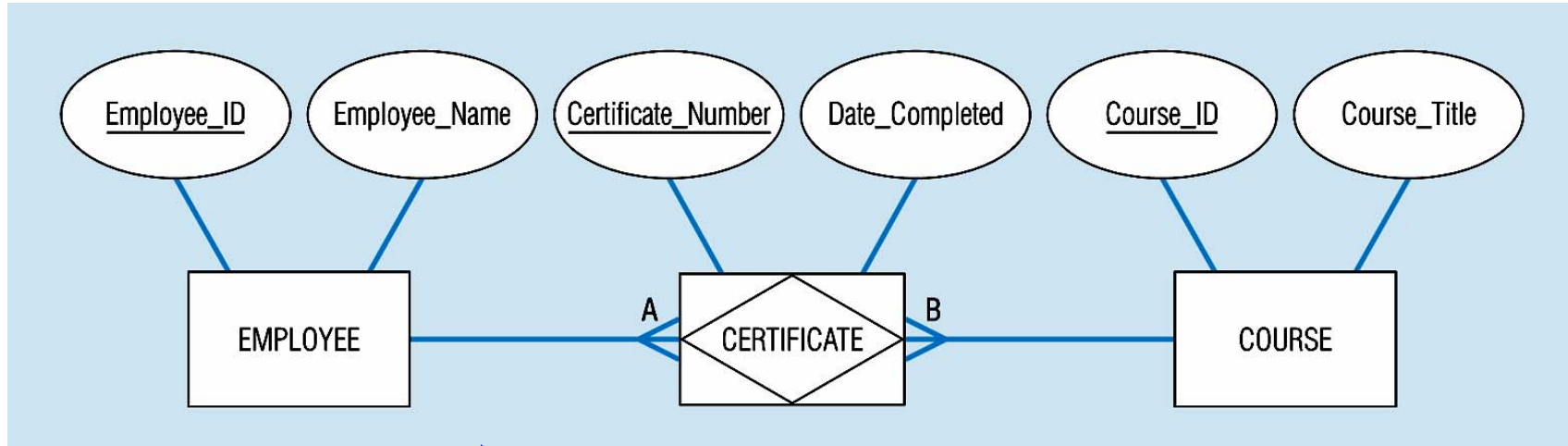| Employee_ID	Course_ID	Date_Completed

COURSE

Course_ID	Course_Title

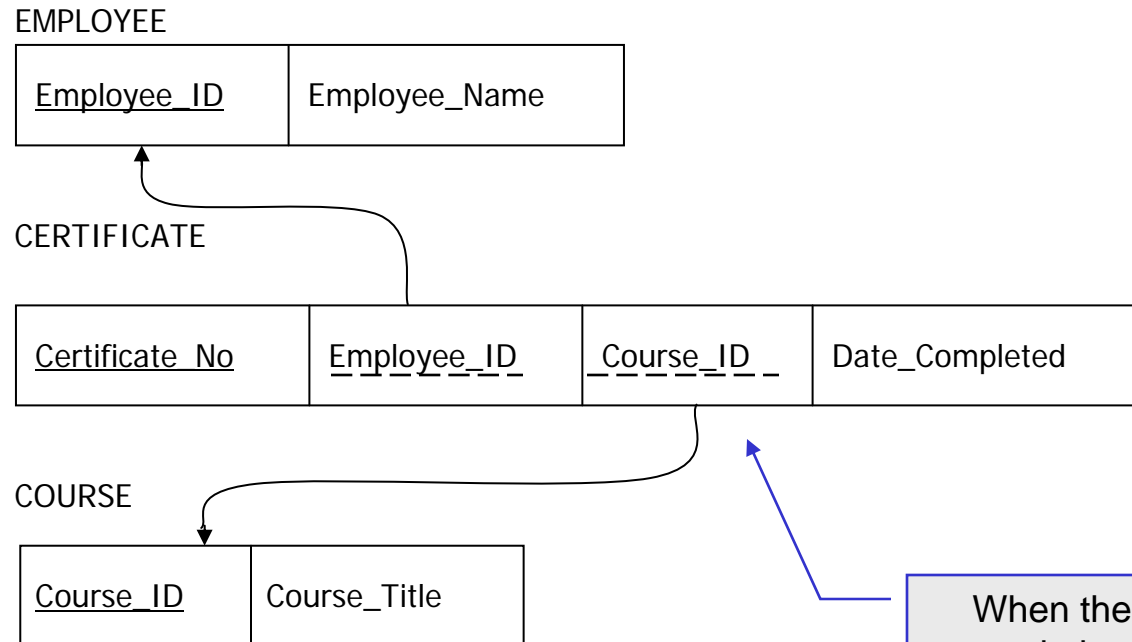The M:M relationship is modeled as a third table.

Problem #4

Note that this is the same problem as #3, however, this time the relationship has been modeled as an associative entity rather than as a simple M:M binary relationship.
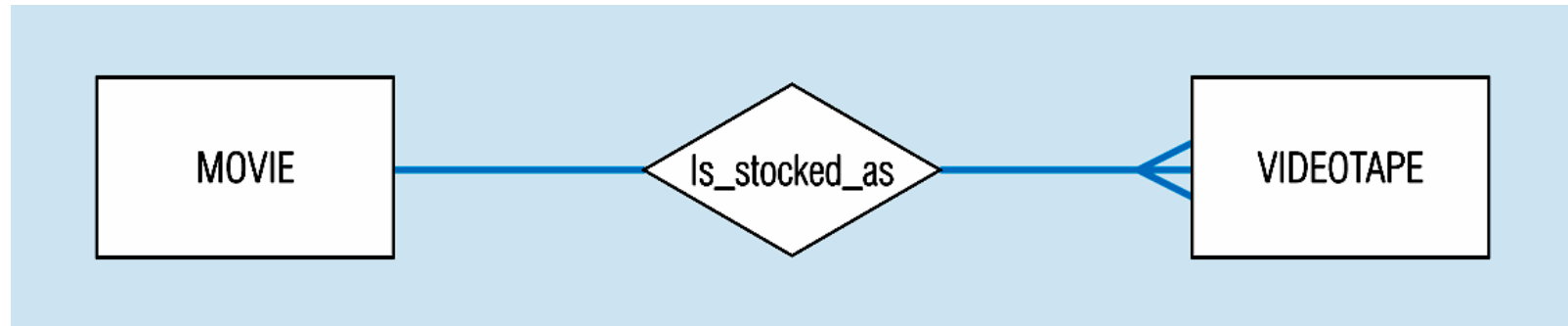
Solution for Problem #4

EMPLOYEE

Employee_ID	Employee_Name

CERTIFICATE

Certificate_No	Employee_ID	Course_ID	Date_Completed

COURSE

Course_ID	Course_Title

When the certificate is modeled as an associative entity and has an identifier (in this case the certificate number), that identifier becomes the key of the relation scheme with the identifiers in the two participating entity sets becoming foreign keys in the associative entity table.

Problem #5

MOVIE — Is_stocked_as — VIDEOTAPE

Basic 1:M binary relationship.

Solution for Problem #5

MOVIE

Movie_Name

VIDEO TAPE

Copy_No	Movie_Name

When the certificate is modeled as an associative entity and has an identifier (in this case the certificate number), that identifier becomes the key of the relation scheme with the identifiers in the two participating entity sets becoming foreign keys in the associative entity table.
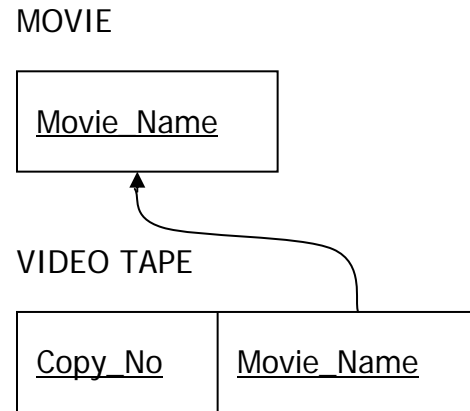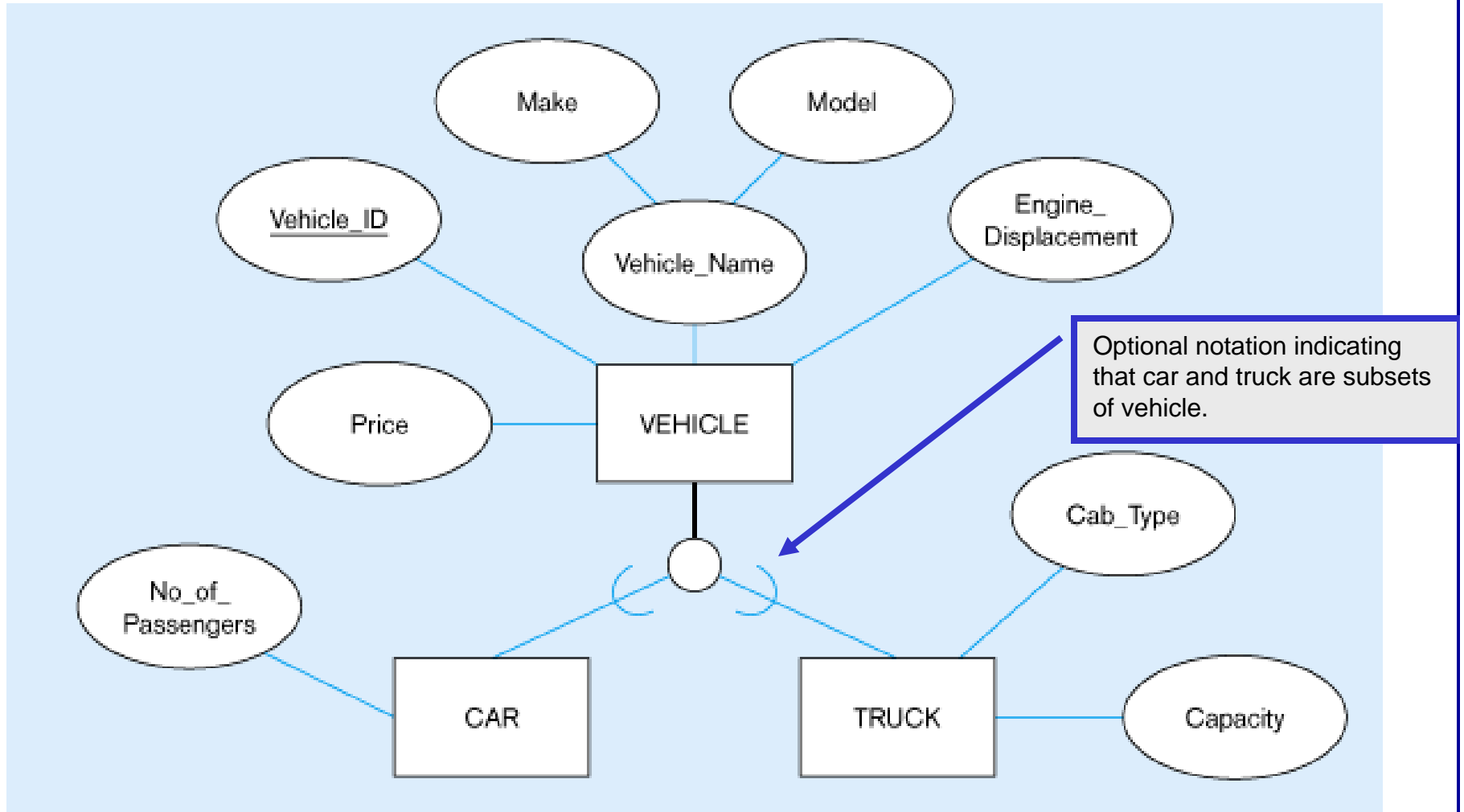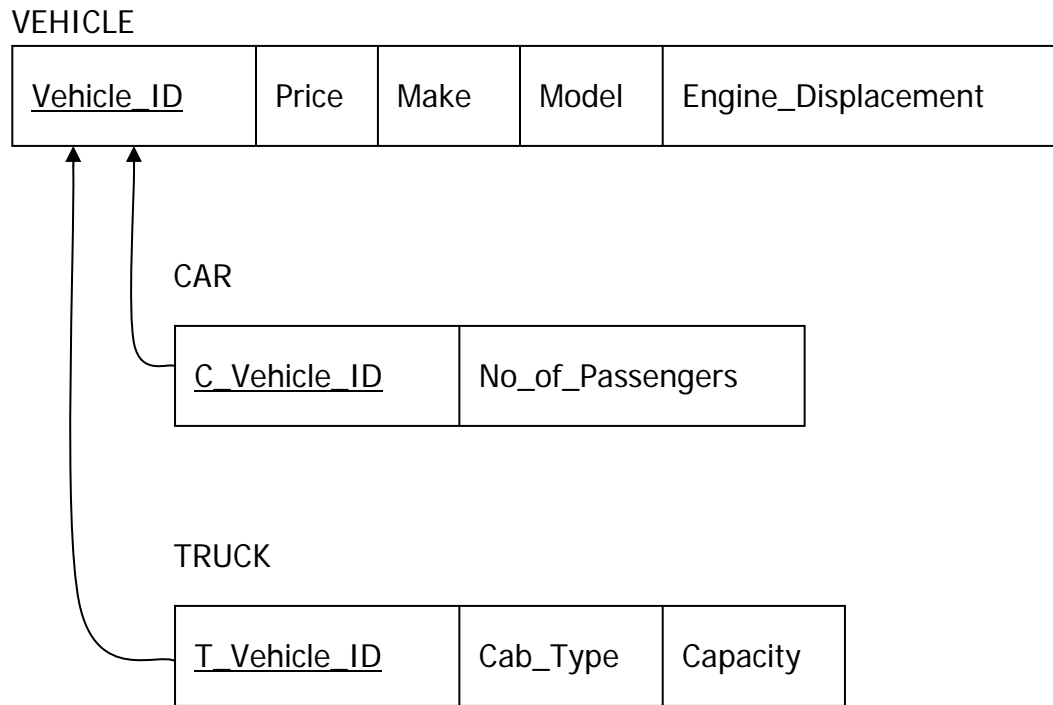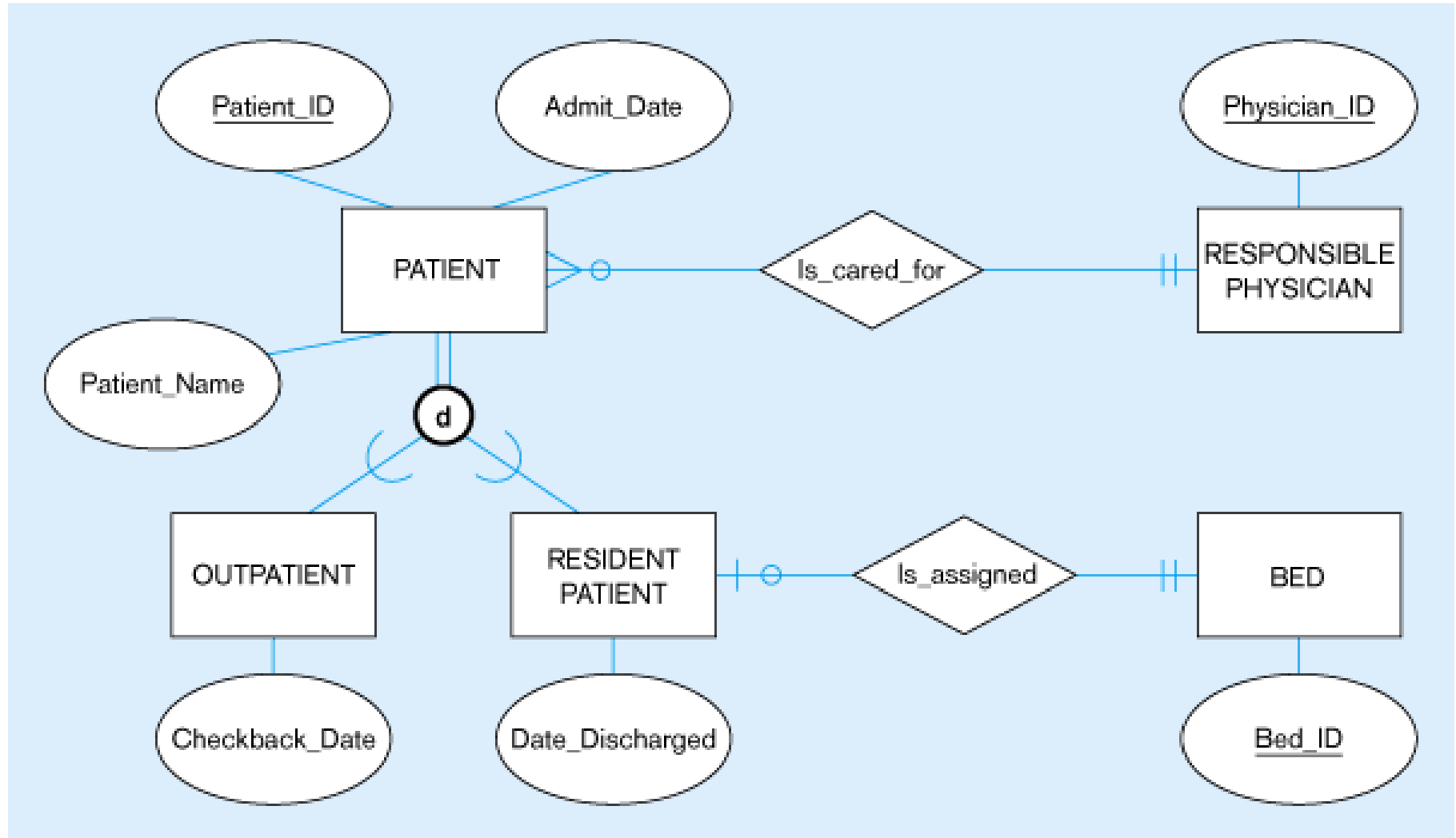
Problem #6

Optional notation indicating that car and truck are subsets of vehicle.

Solution for Problem #6

VEHICLE

Vehicle_ID	Price	Make	Model	Engine_Displacement

CAR

C_Vehicle_ID	No_of_Passengers

TRUCK

T_Vehicle_ID	Cab_Type	Capacity

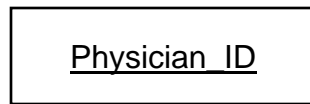# Problem #7

Solution for Problem #7

RESPONSIBLE PHYSICIAN

Physician_ID

PATIENT

Patient_ID	Admit_Date	Physician_ID

OUTPATIENT

O_Patient_ID	Checkback_Date

RESIDENT PATIENT

R_Patient_ID	Date_Discharged	Bed_ID

BED
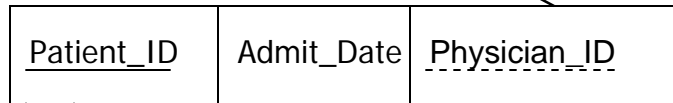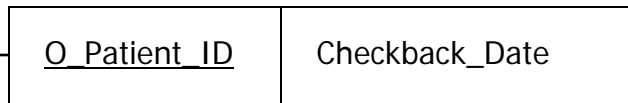
Bed_ID

Problem #8

Solution for Problem #8

PART

Part_No	Description	Location	Manufactured ?	Purhcased ?	Quantity_on_Hand

MANUFACTURED PART

M_Part_No.

PURCHASED PART

P_Part_No.

SUPPLY LINE

P_Part_No.	Supplier_ID	Unit_Price

SUPPLIER

Supplier_ID	Supplier_Name