Data Management and Database Design

INFO 6210

Fall 2016

Assignment _4

Submission Date – Oct/12/2016 Wednesday

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College:	**College Of Engineering**
University:	**Northeastern University**

PART – 1

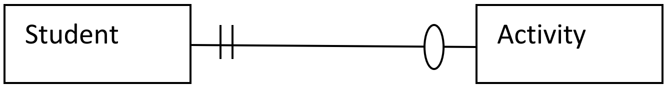
4.

a) Can’t tell

b) City A

c) Can’t tell

5.



Student

Student ID
Name
Address
Age
Activity
No of Years

The student ID will be the identifier which is the primary key as it is unique for every student.

6.

The entity which depends on another entity is known week entity. Associate entities require attributes that are special to the relationship between two entities.

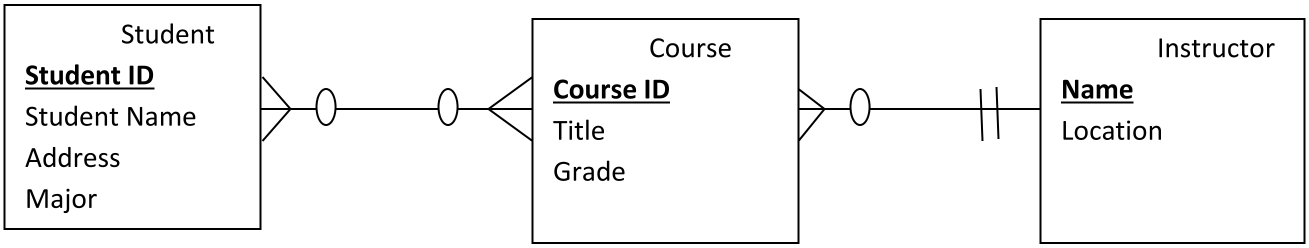
7.

The associative entities in the figure are:

a) Does business in
b) Order line
c) Produced in
d) Uses
e) Works in
f) Has skill
g) Supplies

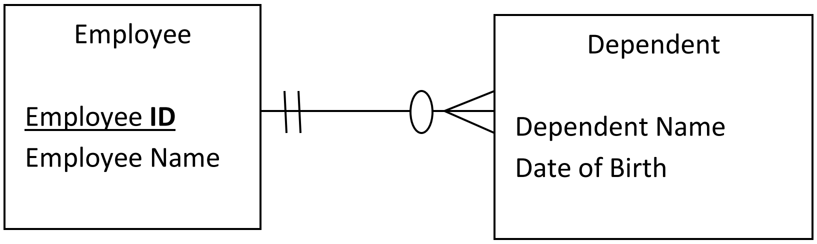
8.

Student Id, Course Id and Instructor Name are identifiers for entities STUDENT, COURSE and INSTRUCTOR respectively



9.

a)



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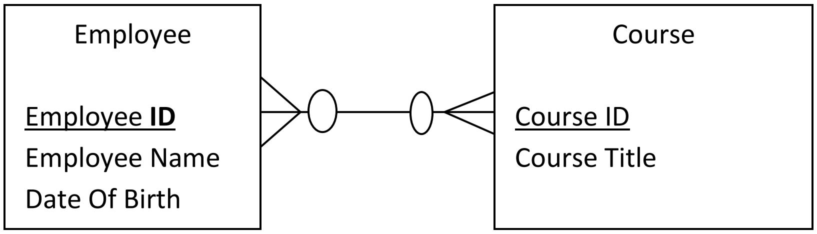
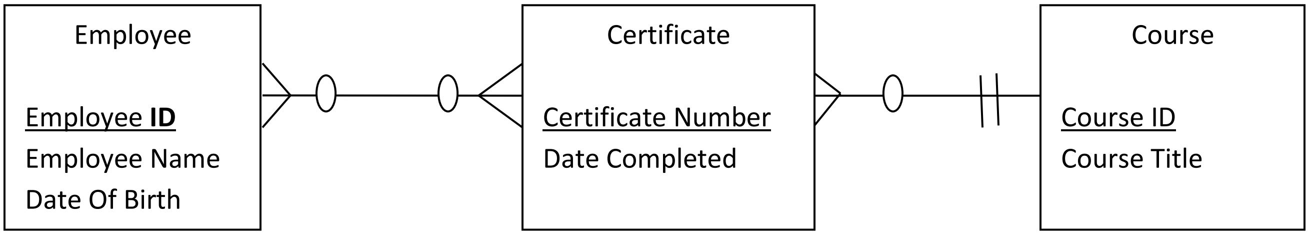
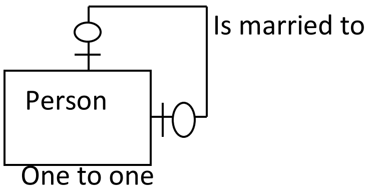


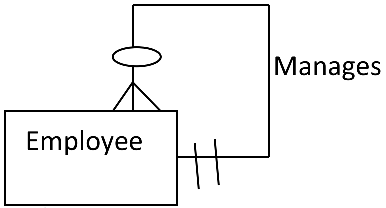
c)



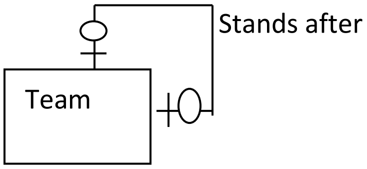
d)



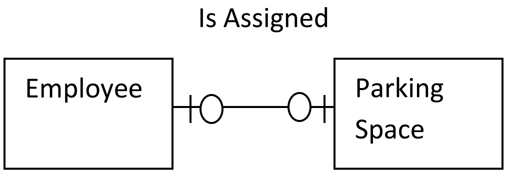
One to one



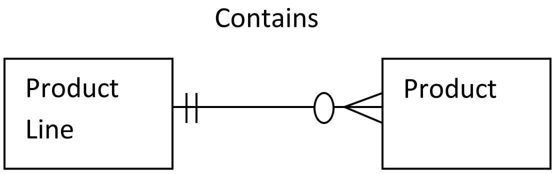
One to many



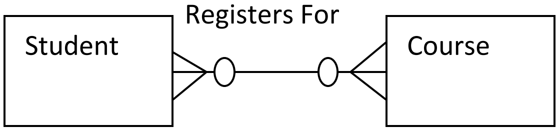
One to one



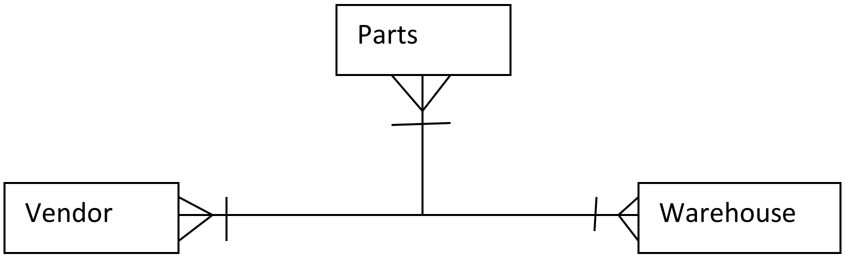
One to One



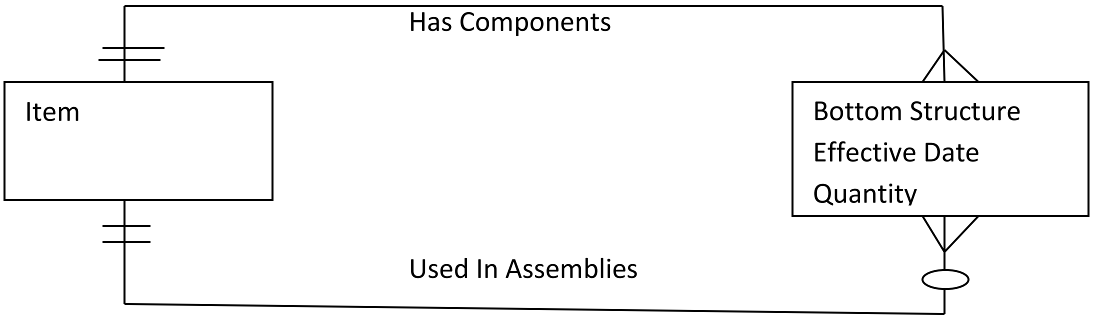
One to Many



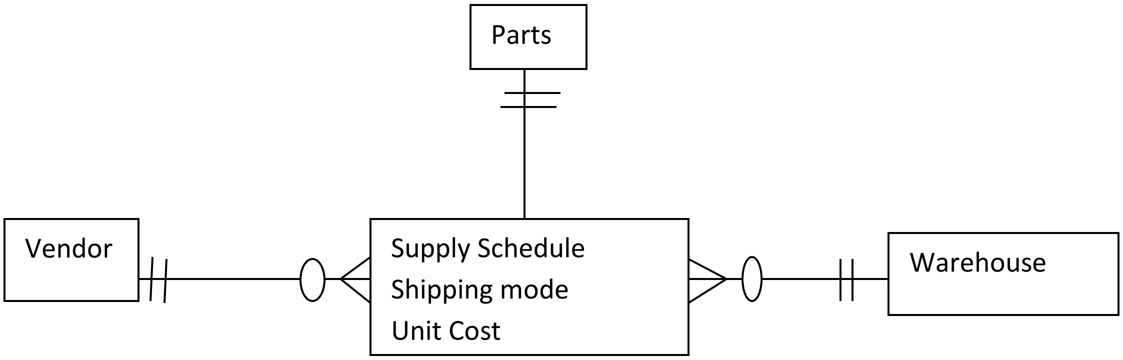
Many to Many



e)

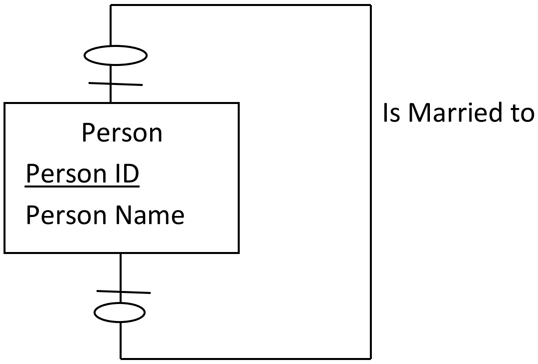

Has Components
Item
Bottom Structure
Effective Date
Quantity
Used In Assemblies

f)

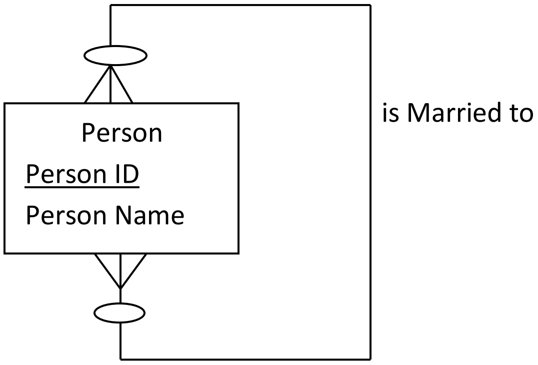

Parts
Vendor
Supply Schedule
Shipping mode
Unit Cost
Warehouse

10)

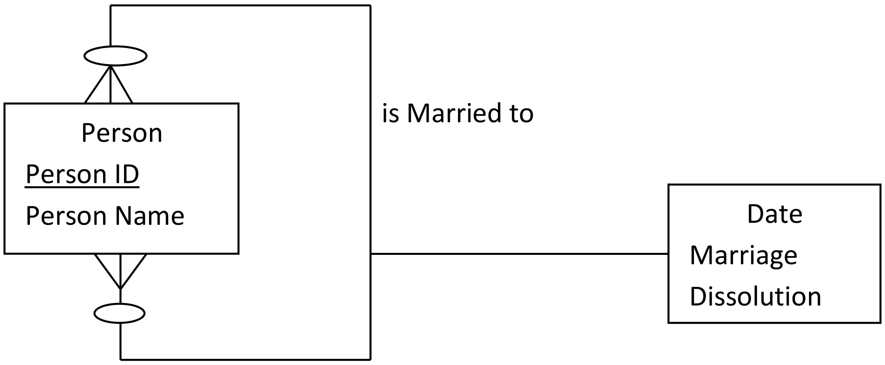
a)


Is Married to
Person
Person ID
Person Name

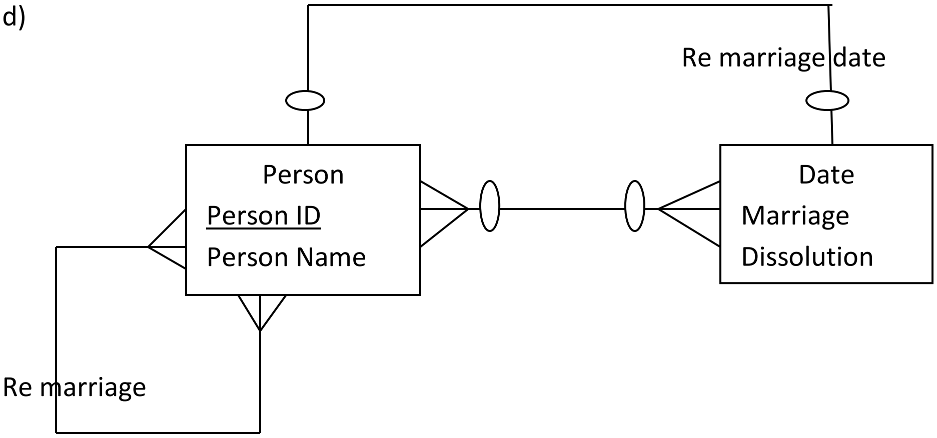
b)


Person
Person ID
Person Name
is Married to

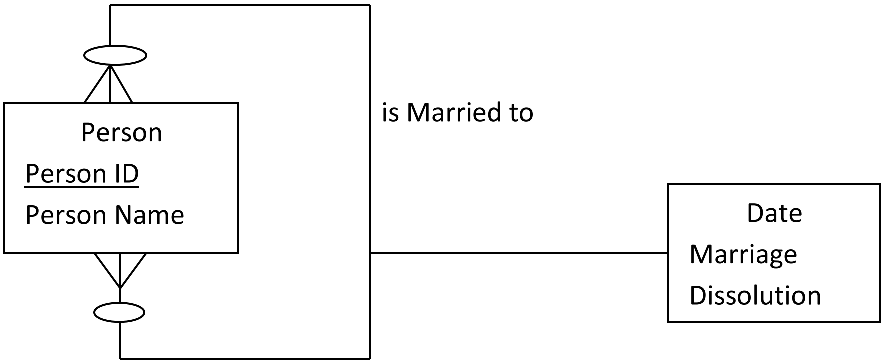
c)


Person
Person ID
Person Name
is Married to
Date
Marriage
Dissolution

d)


Re marriage date
Person
Person ID
Person Name
Date
Marriage
Dissolution
Re marriage

e) Since in section c we have already mentioned in the ER diagram that many person and marry many so in the section e also same is applicable



PART - 2

CHAPTER - 4

1)

Convert	A user who originally was against your project that you include in the development process to bring them onto your side.
Customer Champion	Thoroughly understands the customers’ needs. Has the authority to make decisions that stick.
Customer Representative	Answers your questions about the project.
Devil’s Advocate	Provides a reality check and prevents groupthink.
Executive Champion	The highest ranking customer driving the project. Willing to fight super villains.
Generic Bad Guy	Ranges from annoying naysayer to malicious saboteur/super villain.
Short-Timer	Someone who won't be around for long. May be helpful or may not care all that much.
Sidekick/Gopher	Makes things generally run smoothly. Not glamorous but very useful.
Stakeholder	Anyone who has an interest in the project.

2) Ans – C

3) Ans – D

4) Ans – B

5) Ans – A

6)

Field	**Required?**	**Domain**
Address one	Yes	Valid street addresses or street names without numbers.
Address two	No	Apartment, suite, floor, etc.
City	Yes	Valid cities.
State	Yes	Valid states.
ZIP Code	No	Five digit or ZIP+4 codes as in 12345 and 12345-6789.

7) Ans – C

8) Ans – D

9)

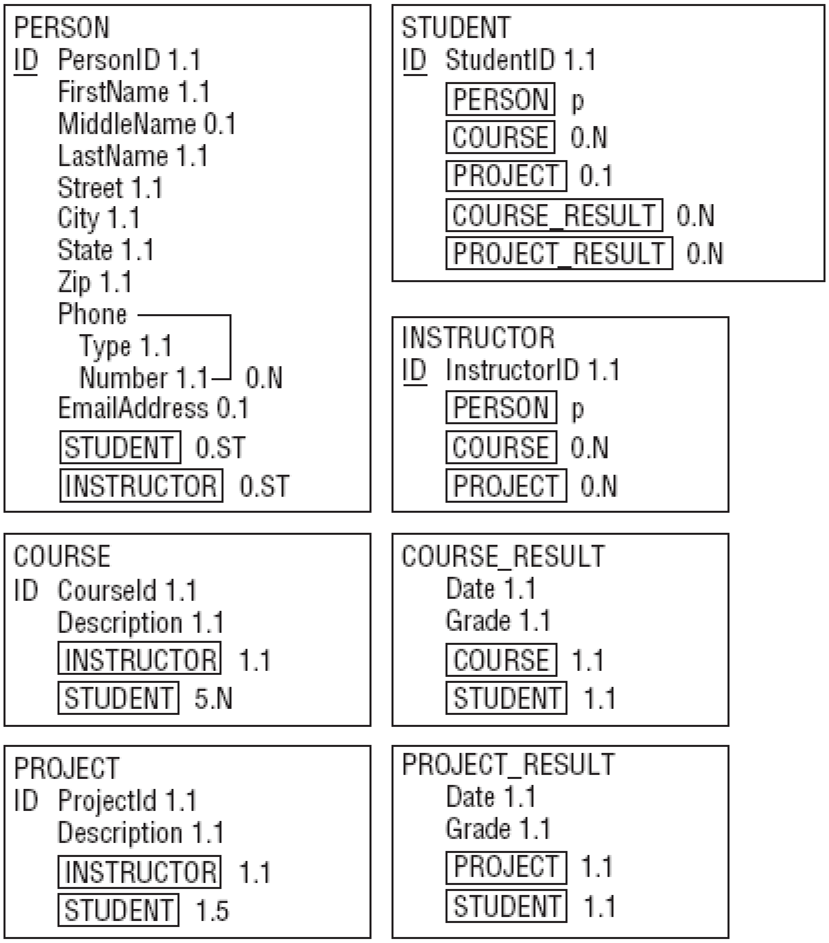
- The user—tries to log in.
- The operating system—validates the user Id and password and grants or revoke access.

10)

In this kind of situation, you need to call your executive Champion. Ideally he can point to your requirements document and show that you did, in fact, consider farbulistic granilation and that everyone agreed the allowance was sufficient. If you are not able to convince then you need to study some extra to provide your executive Champion ammunition. If your executive champion doesn't have enough clout to fight off the Super Villain, you could be in trouble. Executive Champion and Customer Champion spent a huge amount of time fending off attacks for about two years before the project finished.

CHAPTER - 5

1)



PERSON
ID PersonID 1.1
FirstName 1.1
MiddleName 0.1
LastName 1.1
Street 1.1
City 1.1
State 1.1
Zip 1.1
Phone
Type 1.1
Number 1.1 0.N
EmailAddress 0.1
STUDENT 0.ST
INSTRUCTOR 0.ST

STUDENT
ID StudentID 1.1
PERSON p
COURSE 0.N
PROJECT 0.1
COURSE_RESULT 0.N
PROJECT_RESULT 0.N

INSTRUCTOR
ID InstructorID 1.1
PERSON p
COURSE 0.N
PROJECT 0.N

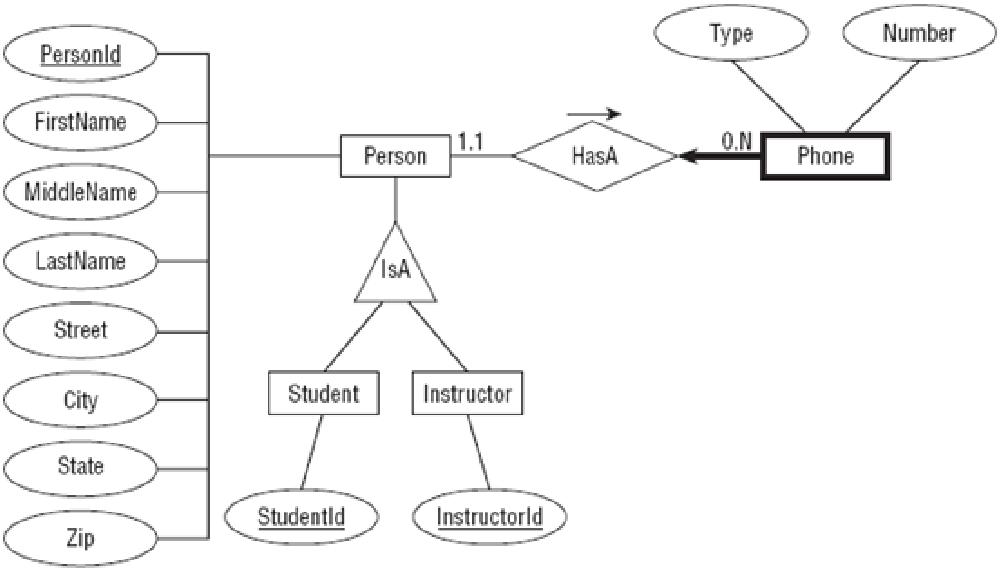
COURSE
ID CourseId 1.1
Description 1.1
INSTRUCTOR 1.1
STUDENT 5.N

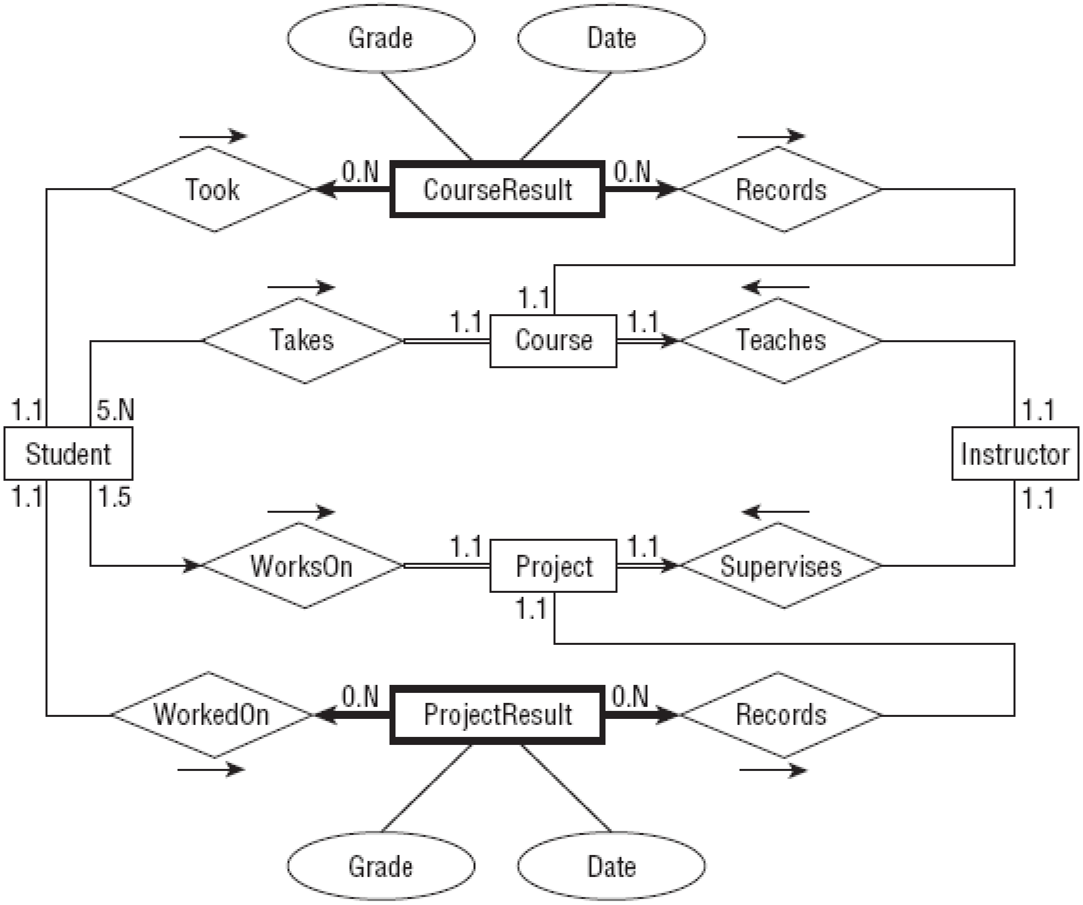
COURSE_RESULT
Date 1.1
Grade 1.1
COURSE 1.1
STUDENT 1.1

PROJECT
ID ProjectId 1.1
Description 1.1
INSTRUCTOR 1.1
STUDENT 1.5

PROJECT_RESULT
Date 1.1
Grade 1.1
PROJECT 1.1
STUDENT 1.1

2)





The Student entity's relationships with Course and Project do not indicate that a Student must be involved with at least one Course or a Project.

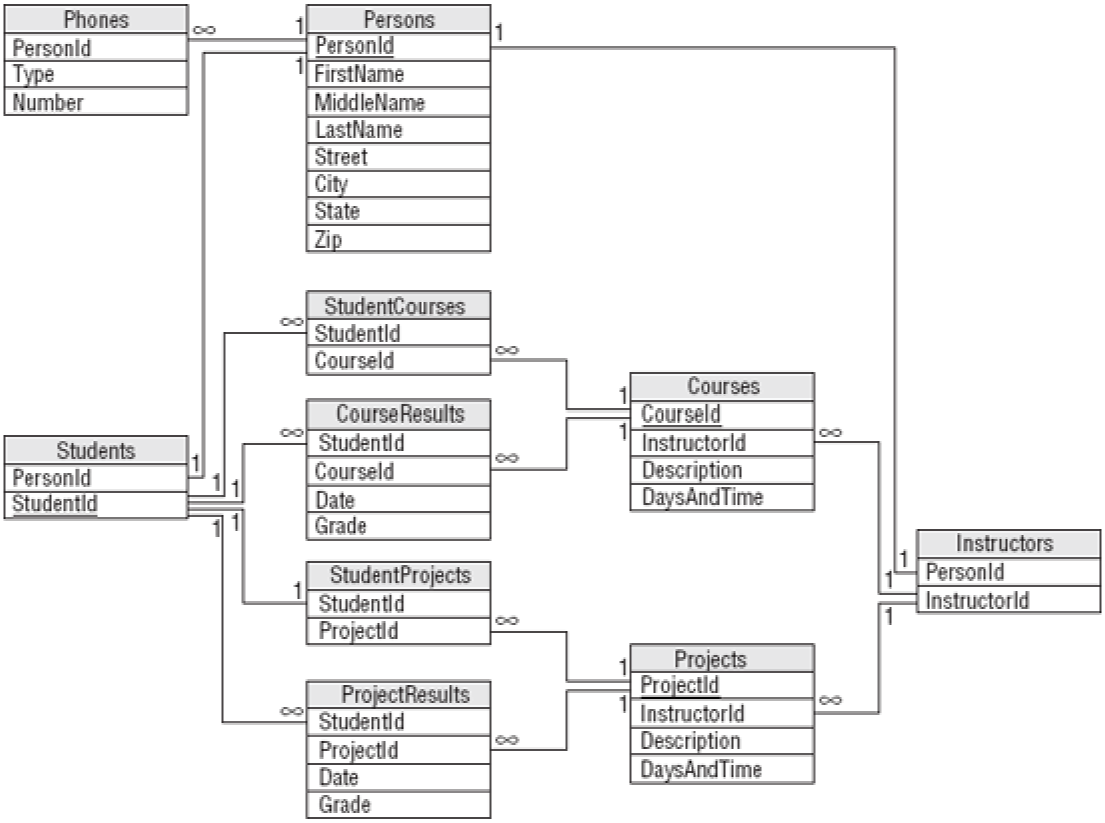
A Course must be involved in a relationship with a Student (or else the Course is canceled) so its line leading toward Student is double (a participation constraint).

A Student can work on at most one Project at a time so its line leading to Project is an arrow (key constraint).

3)

Notice the way this model handles the fact that `Student` and `Instructor` inherit from `Person`. The Persons table holds the basic Person information and a PersonId. The Students and Instructors tables include PersonId foreign keys to link to the corresponding basic Person data.

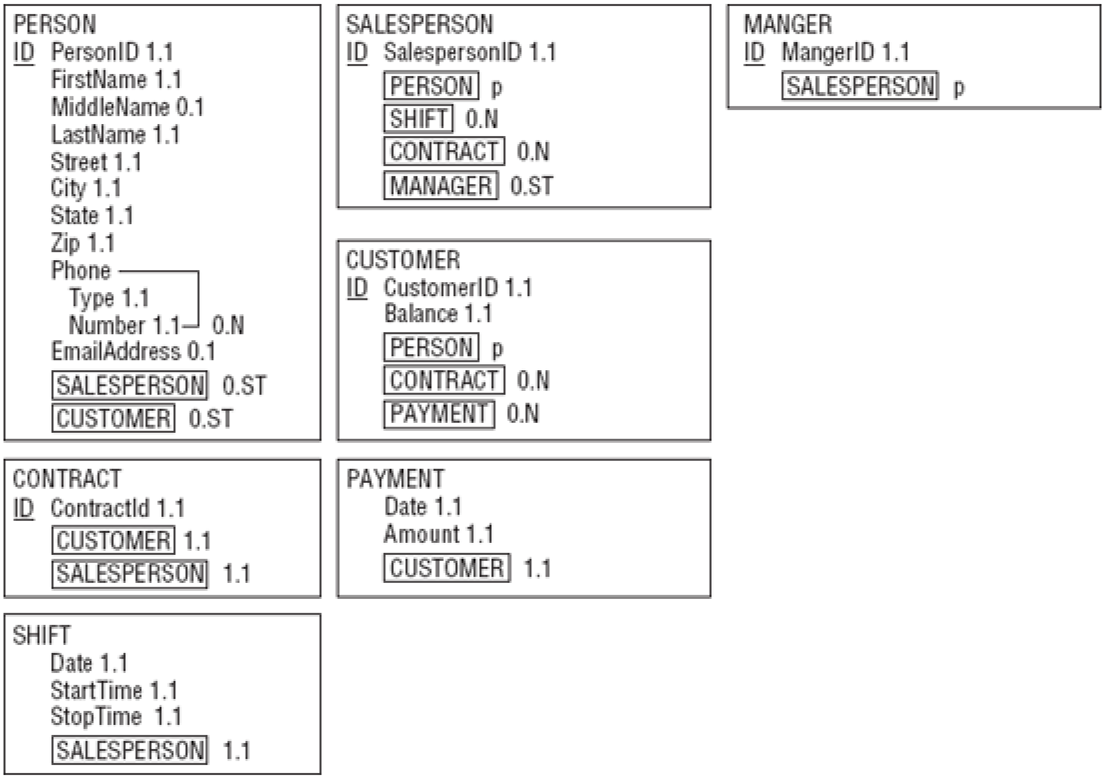
Note also the different approach used for the Student/Course and Instructor/Course relationships. Because a course has exactly one instructor, the Instructors and Courses tables are connected with a simple one-to-many relationship. In contrast, a course has many students so the relationship uses an intermediate StudentCourses table to connect the two to build a many-to-many relationship. (The same reasoning applies to the Student/Project and Instructor/Project relationships.)

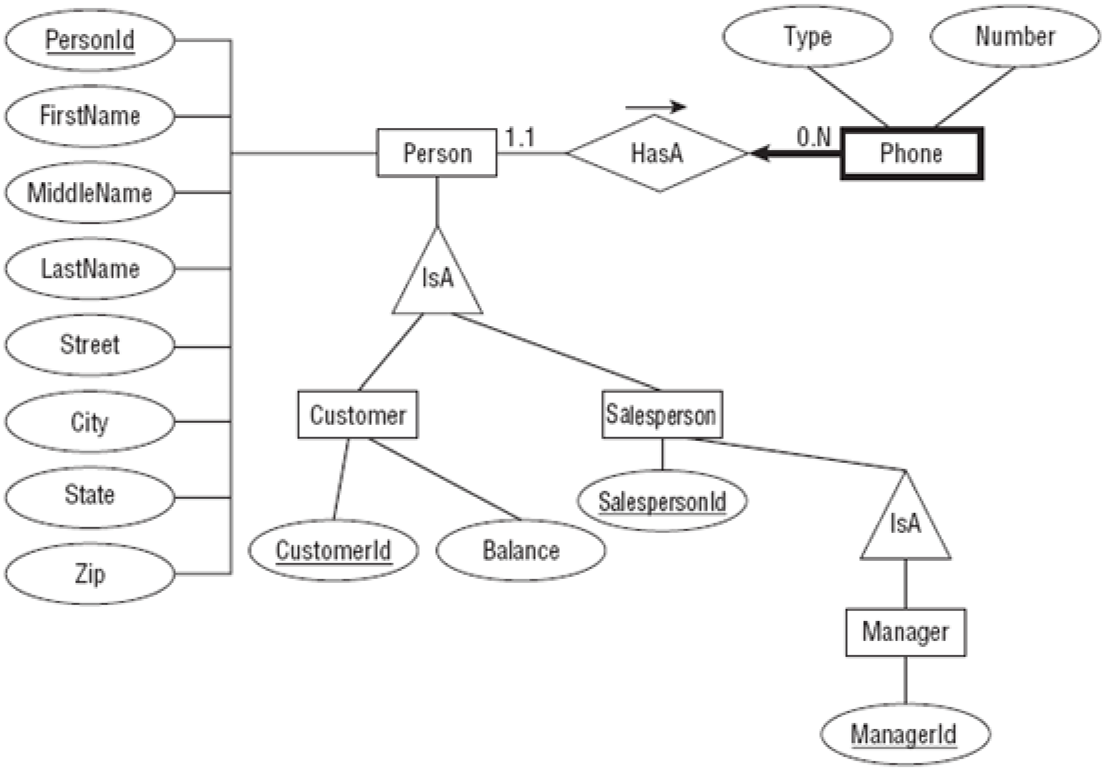


4)

The semantic object model actually does a pretty good job of capturing the Mike's Trikes data. About the only item that isn't described explicitly is the manager's role. In this model, you can deduce the manager at any given time by examining the manager's shift data. If Mike needed a more explicit record of who is managing during a salesperson's shift or when a contract was sold, the model would need to be modified.

5)



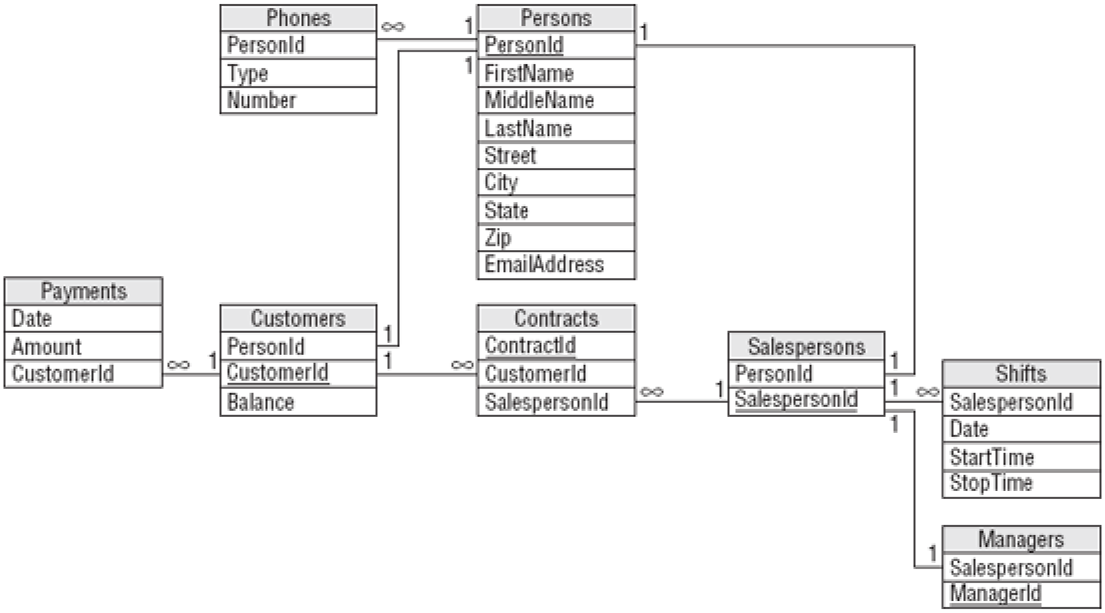


Pay is a weak entity because you look up payments via the Customer who made them. Payment is drawn with a bold rectangle and a thick arrow pointing toward its identifying relationship.

Shifting is also is a weak entity because you look up shift data via the Salesperson who works them. Shift is taken with a thick rectangle and a bold arrow pointing toward its identifying relationship.

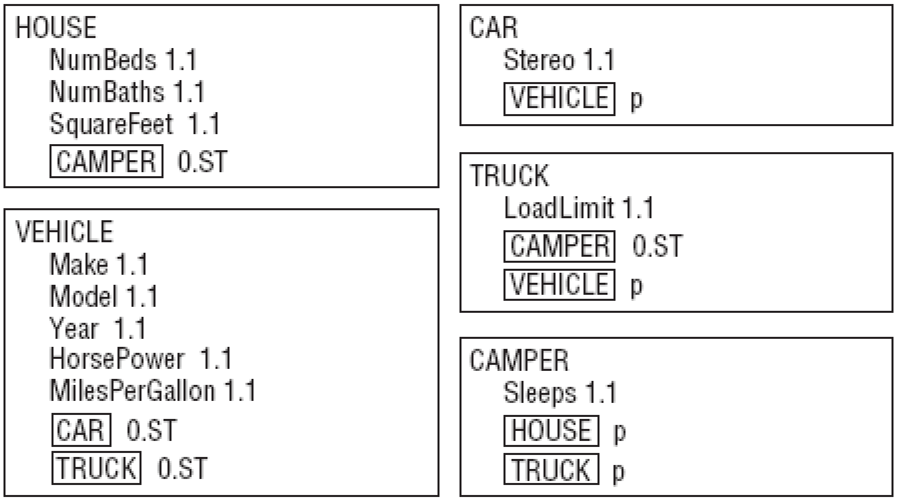
A Contractor must have exactly one cust and exactly one sale person so the lines leading out of Contract toward those other entities are double and key constrains.

6)

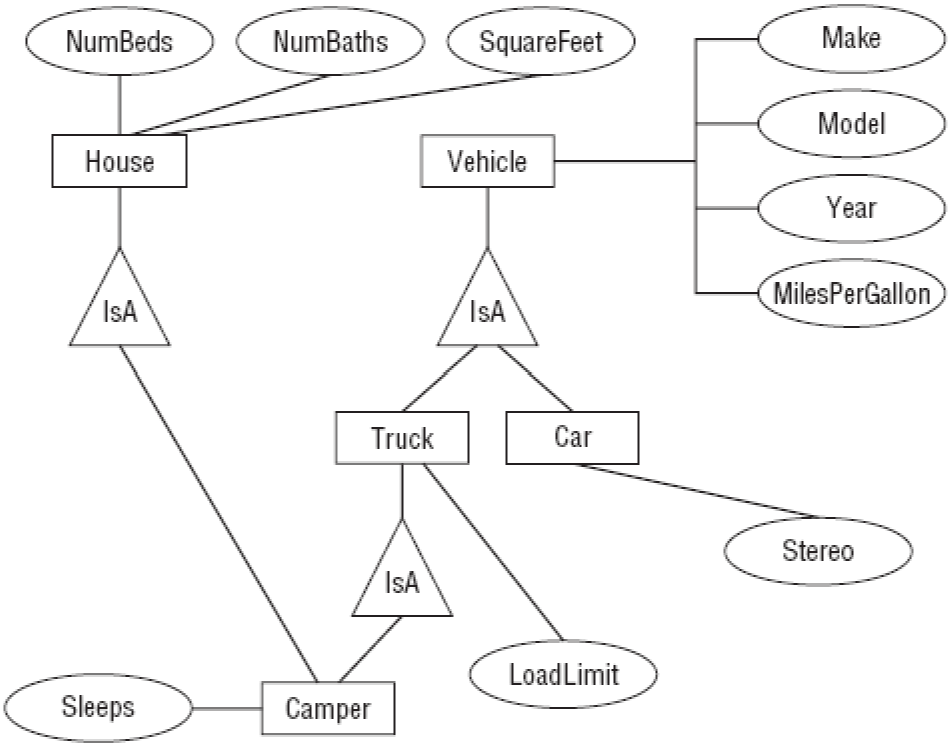


Notice how this model builds the inheritance hierarchy. The Customers and Salespersons tables use PersonId foreign key fields to link to their corresponding records. As usual, the design doesn't capture all of the content available about the situation. In particular, it doesn't indicate that a Customers record must be associated with at least one Contracts record. You should write down this and other facts such as data types and domain info in separate file.

7)


HOUSE
NumBeds 1.1
NumBaths 1.1
SquareFeet 1.1
CAMPER 0.ST
VEHICLE
Make 1.1
Model 1.1
Year 1.1
HorsePower 1.1
MilesPerGallon 1.1
CAR 0.ST
TRUCK 0.ST
CAR
Stereo 1.1
VEHICLE p
TRUCK
LoadLimit 1.1
CAMPER 0.ST
VEHICLE p
CAMPER
Sleeps 1.1
HOUSE p
TRUCK p

8)


NumBeds
NumBaths
SquareFeet
Make
Model
Year
MilesPerGallon
House
Vehicle
IsA
IsA
Truck
Car
Stereo
IsA
LoadLimit
Sleeps
Camper

CHAPTER – 6

1)

Field	**Required**	**Data Type**	**Domain**	**Sanity Checks**
PersonId	Yes	ID	Persons.PersonId	
Type	Yes	String	List: Cell, Home, Fax	
Number	Yes	String	Phone numbers	

Field	Required	Data Type	Domain	Sanity Checks
PersonId	Yes	ID	Any ID	
FirstName	Yes	String	Any string	
MiddleName	No	String	Any string	
LastName	Yes	String	Any string	
Street	Yes	String	Any string	
City	Yes	String	Any string	
State	Yes	String	List: (states)	
Zip	Yes	String	ZIP or ZIP+4 format	Verify ZIP or ZIP+4 format
EmailAddress	No	String	Valid email address	Contains one @ symbol
MedicalNotes	?	String	Any string	
IceQualified?	?	Yes/No	Yes or No	

Field	**Required**	**Data Type**	**Domain**	**Sanity Checks**
RockQualified?	?	Yes/No	Yes or No	
JumpQualified?	?	Yes/No	Yes or No	

Field	**Required**	**Data Type**	**Domain**	**Sanity Checks**
PersonId	Yes	ID	Persons.PersonId	
GuideId	Yes	ID	Any ID	
IceInstructor?	Yes	Yes/No	Yes or No	
RockInstructor?	Yes	Yes/No	Yes or No	
JumpInstructor?	Yes	Yes/No	Yes or No	

Field	Required	Data Type	Domain	Sanity Checks
PersonId	Yes	ID	Persons.PersonId	
ExplorerId	Yes	ID	Any ID	

Field	Required	Data Type	Domain	Sanity Checks
PersonId	Yes	ID	Persons.PersonId	
OrganizerId	Yes	ID	Any ID	

Field	Required	Data Type	Domain	Sanity Checks
AdventureId	Yes	ID	Any ID	
ExplorerId	Yes	ID	Explorers.ExplorerId	
EmergencyContact	Yes	ID	Persons.PersonId	

Field	Required	Data Type	Domain	Sanity Checks
OrganizerId	Yes	ID	Organizers.OrganizerId	
TrekId	Yes	ID	Treks.TrekId	
DateSold	Yes	Date	Any date	Before the trek's start date. Between January 1, 2000 and December 31, 2050 (or some other very early and late dates).
IncludeAir?	Yes	Yes/No	Yes or No	
IncludeEquipment?	Yes	Yes/No	Yes or No	
TotalPrice	Yes	Currency	Monetary amount > $0	Price > $250 (or some minimum sane value).
Notes	?	Yes/No	Yes or No	

2)

Type: Verify that the type is one of Home, Work, Cell, or Fax. Alternatively if you think this list might change in the future, you could put these values in a lookup table.

Number: Verify that the value has a valid phone number format. In the United States, you would probably want to verify that it is a 10-digit number of the format ??? ???? ???? and you should allow for an extension.

Table Verify that the trek has room for this explorer.

Verify that the explorer's IceQualified?, RockQualified?, and JumpQualified? values include those required for this trek.

ExplorerId/TrekId: Verify that this combination is unique. An explorer should not buy the same trek twice. (We're assuming that the same trip on different dates gets a different record in the Treks table. Some people may very well want to go to the same places again.)

EmergencyContact: Verify that the EmergencyContact is not going on the same trek listed for this Adventures record.

IncludeAir?/Notes: If IncludeAir? is Yes, the Notes field should include flight information such as the explorer's starting airport and meal preferences. The database can probably not verify that the notes make sense (who knows if the low sodium meal is available on that flight?) but it can verify that the Notes entry has some minimum length if IncludeAir? is Yes.

3)

The fact that one of the company's owners asked which calculation would give the customer the biggest discount if they both purchase airline tickets and rent equipment (adding the two discounts and take 15% off gives the biggest discount) further implies that they might someday change the way they perform this calculation. That gives you more reason to extract this rule from the database so it's easier to change later.

4)

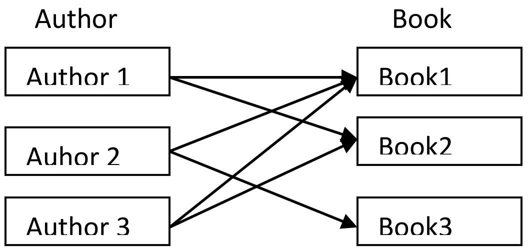
Name	**Value**	**Purpose**
MinimumDate	January 1, 2000	Sanity check date for DateSold, StartDate, and EndDate.
Maximum Date	December 31, 2000	Sanity check date for DateSold, StartDate, and EndDate.
Minimum TotalPrice	$250	Sanity check price for an Adventure's TotalPrice.
Minimum TrekPrice	$250	Sanity check price for a Trek's Price.
Minimum PricePerDay	$100	Sanity check minimum price per day for a Trek's Price.
Maximum Explorers	20	Sanity check maximum number of explorers on a trek.

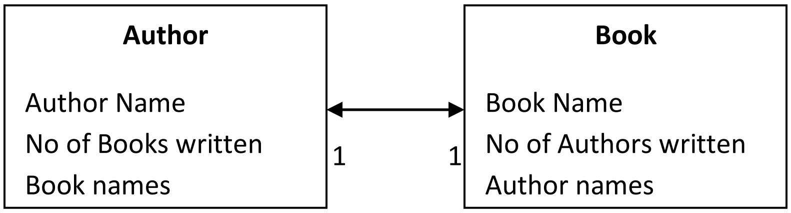
PART – 3

CHAPTER - 4

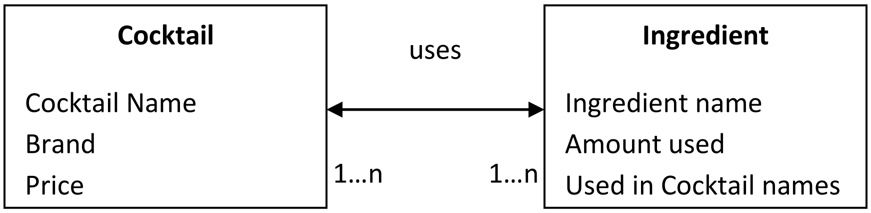
1.

When seeing from left to right
Author has the optionality 1, since an author can have one book or more than one book; moreover author cannot be assign to zero books.
When seeing from right to left
Book has optionality 1, since a book can have one author or more than one author, moreover book should have atleast one author.
It is a many to many concept.



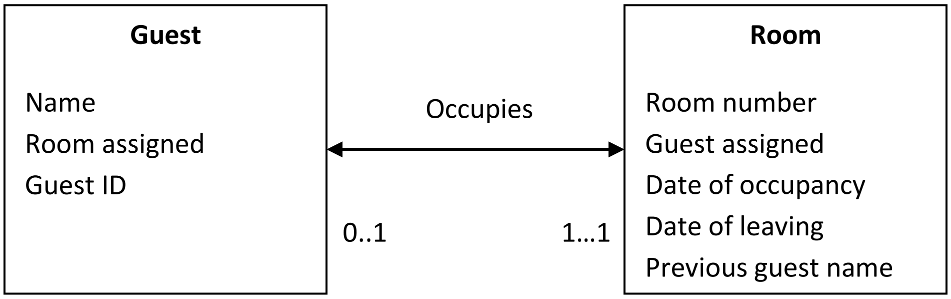


2.
In this data model for cocktail recipes, the cocktail will be using one or more ingredient and similarly ingredient can be used in one or more cocktails so it is an many to many relationship and there might be some missing item also.



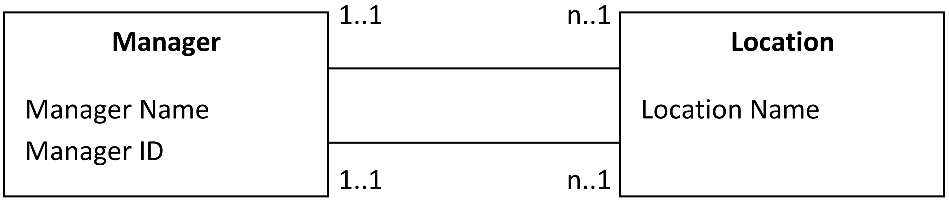
3.

In this data model, the guest has to have one room in the hostel but the room in the hostel may or may not guest, so there may be empty rooms without guest.
To maintain the historical information about the room occupancy, the data model should hold an attribute to maintain the previous data on the room like who stayed in that room before the present guest.



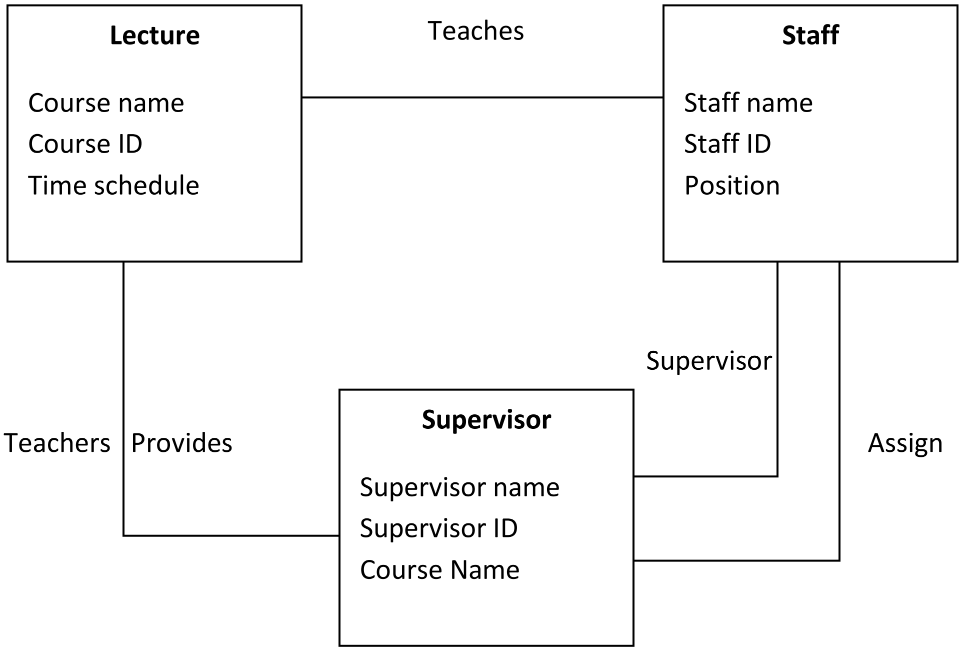
CHAPTER – 5

1.

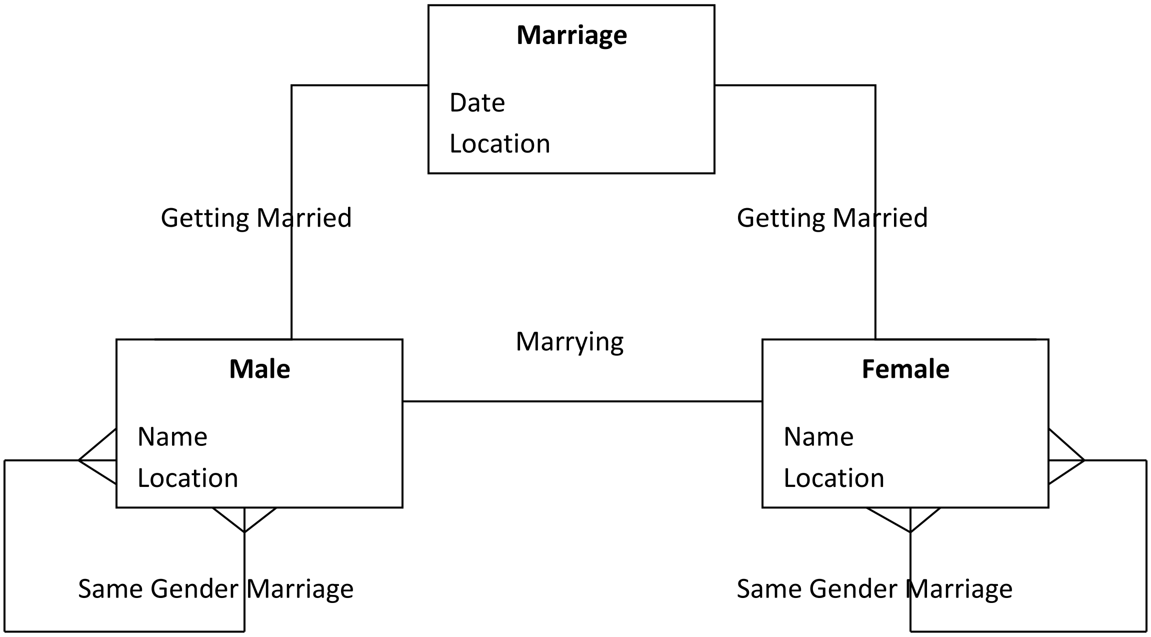


2.

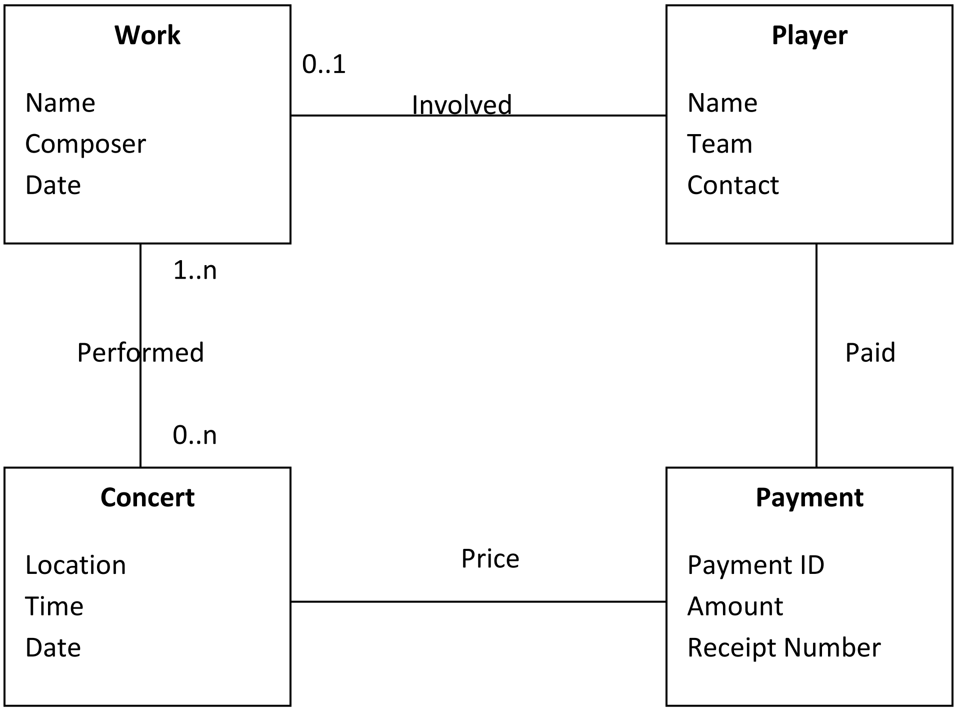
This data model refers the teaching course were the one lecture can be taken by many staff but in that one staff will be assigned as supervisor. The three classes are staff, supervisor and lecture



3.


Marriage
Date
Location
Getting Married
Getting Married
Marrying
Male
Name
Location
Female
Name
Location
Same Gender Marriage
Same Gender Marriage

4.


Work
Name
Composer
Date
0..1
Involved
Player
Name
Team
Contact
1..n
Performed
0..n
Paid
Concert
Location
Time
Date
Price
Payment
Payment ID
Amount
Receipt Number