Converting ER Digro to Relational model.

ER Model → Relational Model

ER Model ⇒ Visual rep of how data is related to each other.

1) Entity
2) Attribute → Types of Attribute
3) Relationship.
4) Entity set ⇒ collection of Entities of similar Type
5) Relationship set ⇒ collection of relationship of similar type.

6) Descriptive Attributes ⇒ when a relationship have attributes.

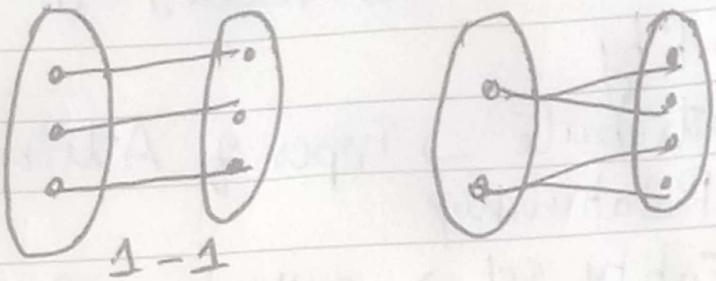
7) Degree of relationship ⇒ No of participating entities in a relationship.

Binary ⇒ degree ⇒ 2
Ternary ⇒ degree 3
n-ary = degree n

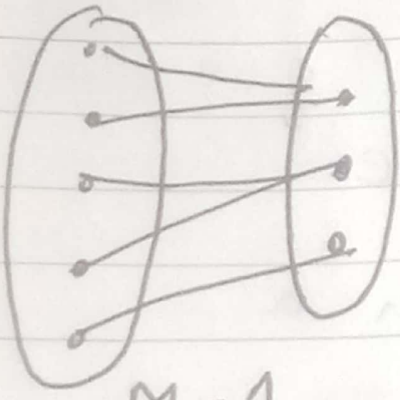
8) Mapping Cardinalities:-

Cardinality ⇒ How No of entities is one entity set associated with no of entities of other set via relationship set

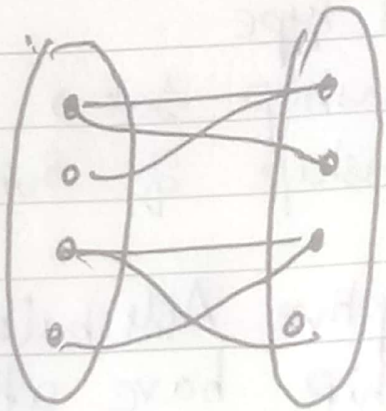
1-1
1-M
M-1
M-M



1-1



M-1



M-M

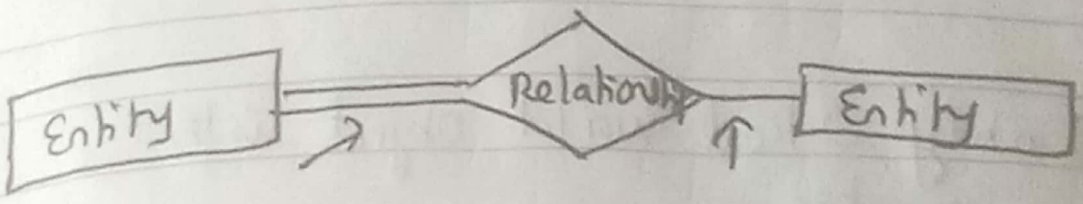
9) Participation Constraints

Total Participation ⇒ Each entity is involved in relationship.

Rep. by double lines.

Partial participation :-

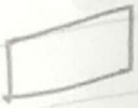
Represented by Single lines.



Total participation

partial participation.

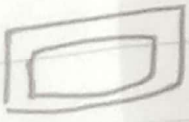
Basic Components

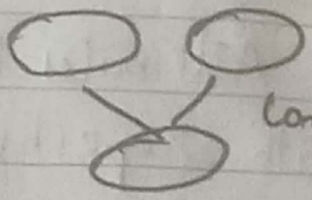
 → Entity

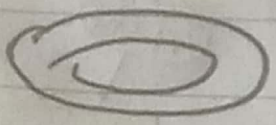
 Attribute

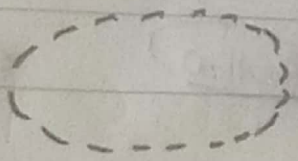
 Relationship

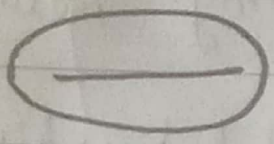
 link b/w Attribute & Entity set to relationship

 weak entity

 Composite attribute

 Multi valued attribute

 Derived attribute

 Key attribute

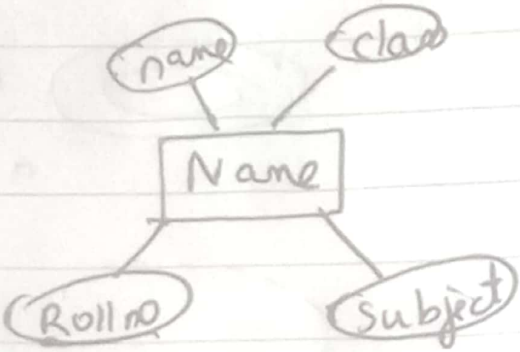
ER-To-Relational

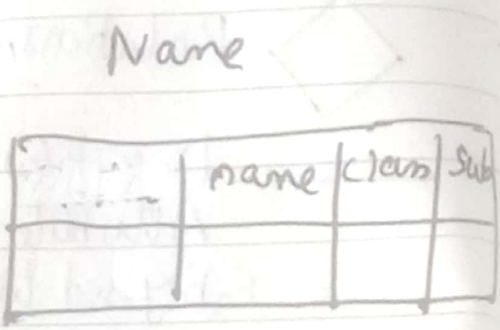
Manual Automated

1) Entity → Real world object with some attributes.

Mapping process

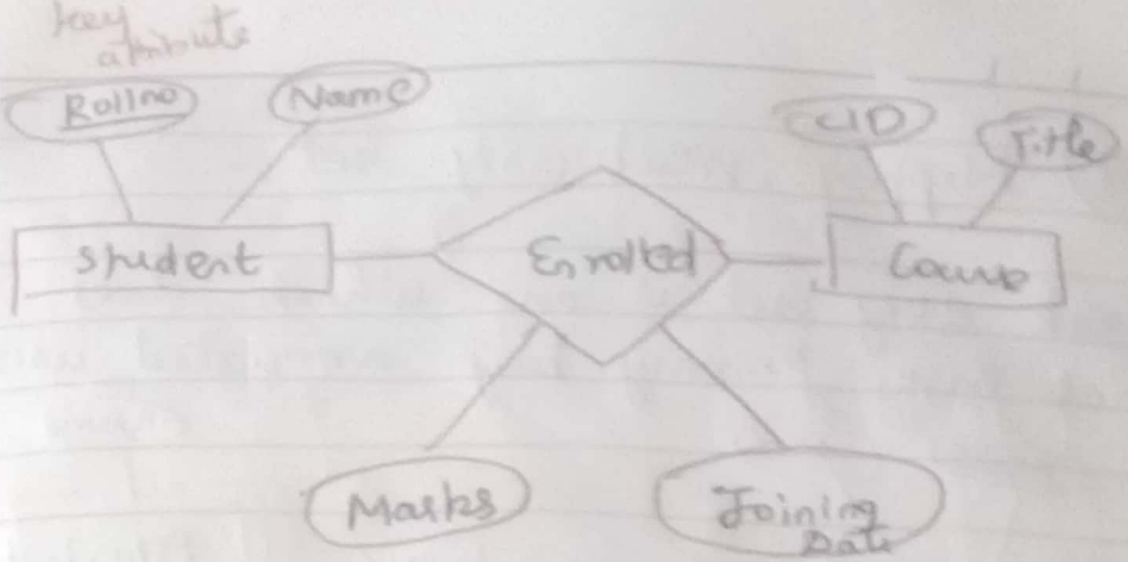
1. Create table for each entity
2) Attributes becomes fields of tables with respective data types.
3) Declare a primary key





2) Mapping Relationship :-

Relationship is association among entities.



Mapping process

1. Create table for relationship
2. Add primary keys of all participating entities as field of table with their respective data types.
3) If relationship has attribute add it as field of table.
4) Declare primary key composing all primary keys of participating Entities.
5) Declare all foreign key constraints.

Student

RollNo	Name

Course

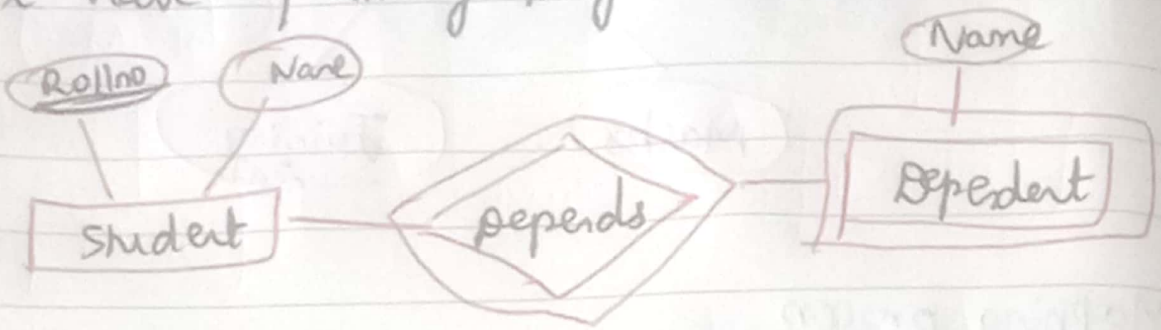
CID	Title

Enrolled

marks	Joing Date	RollNo	CID

3) Mapping weak entity set :-

Weak entity set is one which does not have primary key associated with it.



Mapping Process

1. Create table for weak entity set
2. Add all attributes to table as field
3. Add primary key identifying entity set
4. Declare all foreign key constraints.

Student

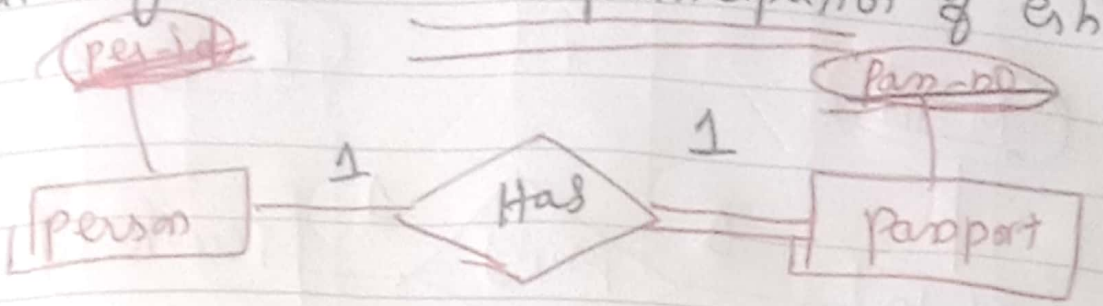
RollNo	Name

Dependent

Name	RollNo

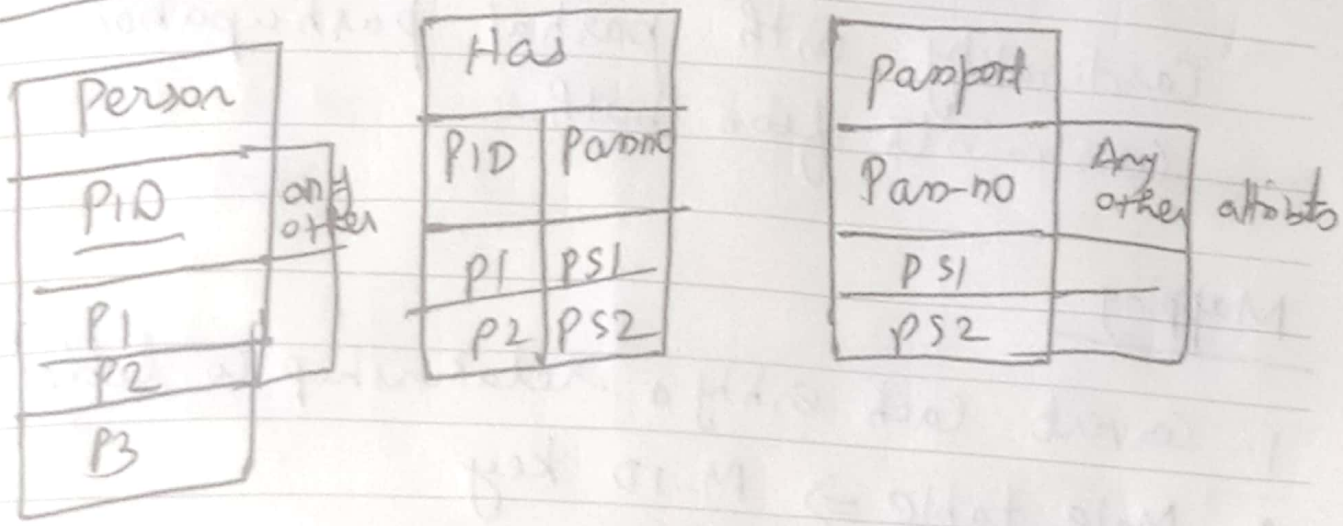
4) Mapping Cardinalities

Case 1:- Binary relationship with 1:1 cardinality with total participation of entity



↓ always
Passport owned by 1 person,
^ person has 0 or 1 passportno

Mapping Conversion



since each PID & pass-no has only one entry in has table, we can merge all three tables into 1 with attributes

PID	other person attribute	Pass no	other passport attribute

PID → Unique & not null [key] Passport ⇒ Not key as for same person it is NULL

Case 2

Binary relationship with 1:1 cardinality & partial participation of both entities.

Male marries 0 or 1 female & vice versa. So it is 1:1

Cardinality with partial participation constraints from both.

Mapping

1. Convert each entity & relationship to tables
2. Male table ⇒ M-ID key
3. Female → F-ID key
4. Marry → R/B Male & Female

Male

MID	Other attributes
M1	—
M2	—
M3	—

Marry

MID	FID
M1	F2
M2	F1

Female

FID	Other female attr
F1	—
F2	—
F3	—

All Tables can not be merged to one

possibilities are

Male

MID	FID

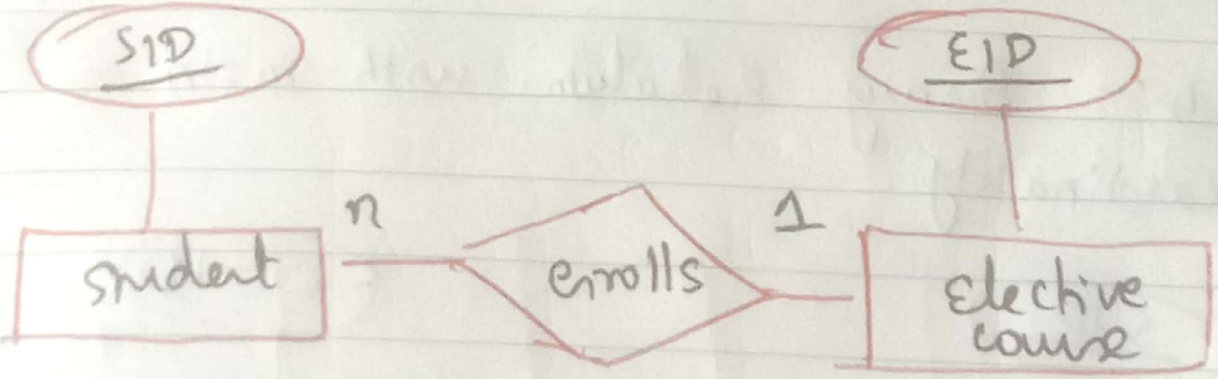
female

FID

Note:- 1) Binary relationship with 1:1 cardinality will have 2 table if partial participation

2) If atleast 1 entity has total participation no of tables reqd will be 1.

Case 3 :- Binary relationship with n:1 cardinality.



Every student can enroll only in one elective but for an elective course there can be more than one student.

Mapping

Student

SID	....
S1	-
S2	-
S3	-

Enrolls

SID	EID
S1	E1
S2	E2
S3	E1

Elective

EID	....
E1	-
E2	-

In above table S-ID not repeating in Enroll table. key for both table same as EID is not unique

It can be further reduced to two table

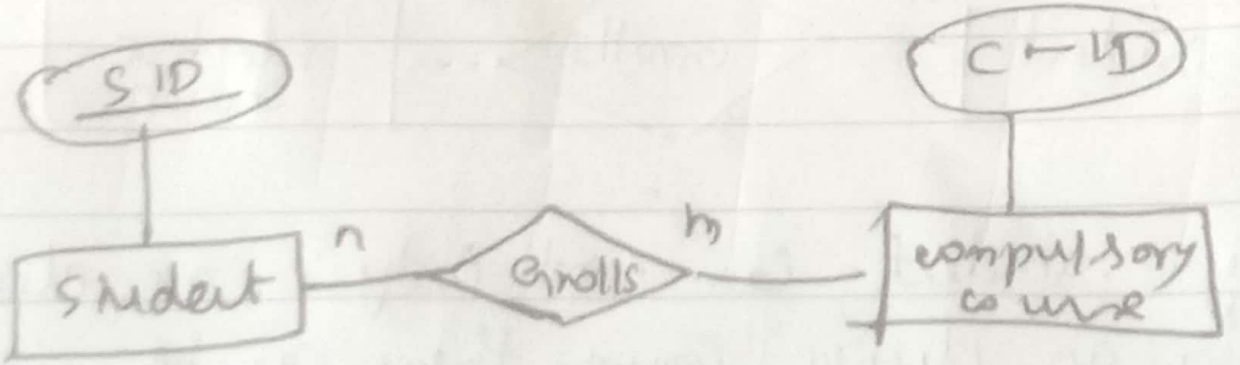
Student

SID	EID

Elective

EID

Case 4:- Binary relation with m:n Cardinality



Mapping

Student

S-ID	...
S1	
S2	
S3	
S4	

Enrolls

SID	CID
S1	C1
S2	C2
S3	C1
S4	C3
S4	C2
S3	C3

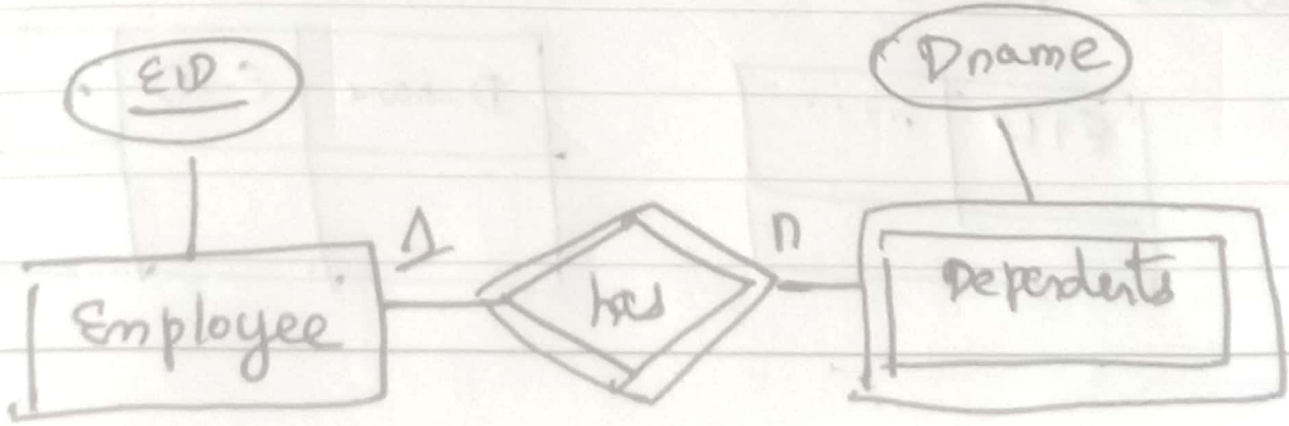
Compulsory Course

C-ID	...
C1	
C2	
C3	
C4	

From table, both S-ID and C-ID are repeating in Enrolls table, but its combination is unique, so it is considered as key for Enroll table

All table keys are different they cannot be merged into one table

Case 5:- Binary relationship with weak entity



In above fig, employee have many dependents and one dependent can depend on one employee.

A dependent does not have any existence without an employee

Dependent => Weak entity ⇒ Participation is total

⇓

key is a combination of key of its identifying entity (EID) and its partial key (Dname)

Employee

EID	....
E1	
E2	
E3	

Has

EID	Dname
E1	RAM
E1	Sri
E2	Ram
E3	Sam

Dependents

Dname	EID	....
RAM	E1	-
SRI	E1	-
RAM	E2	-
SAM	E3	-

Dname is key for has as well as dependent table