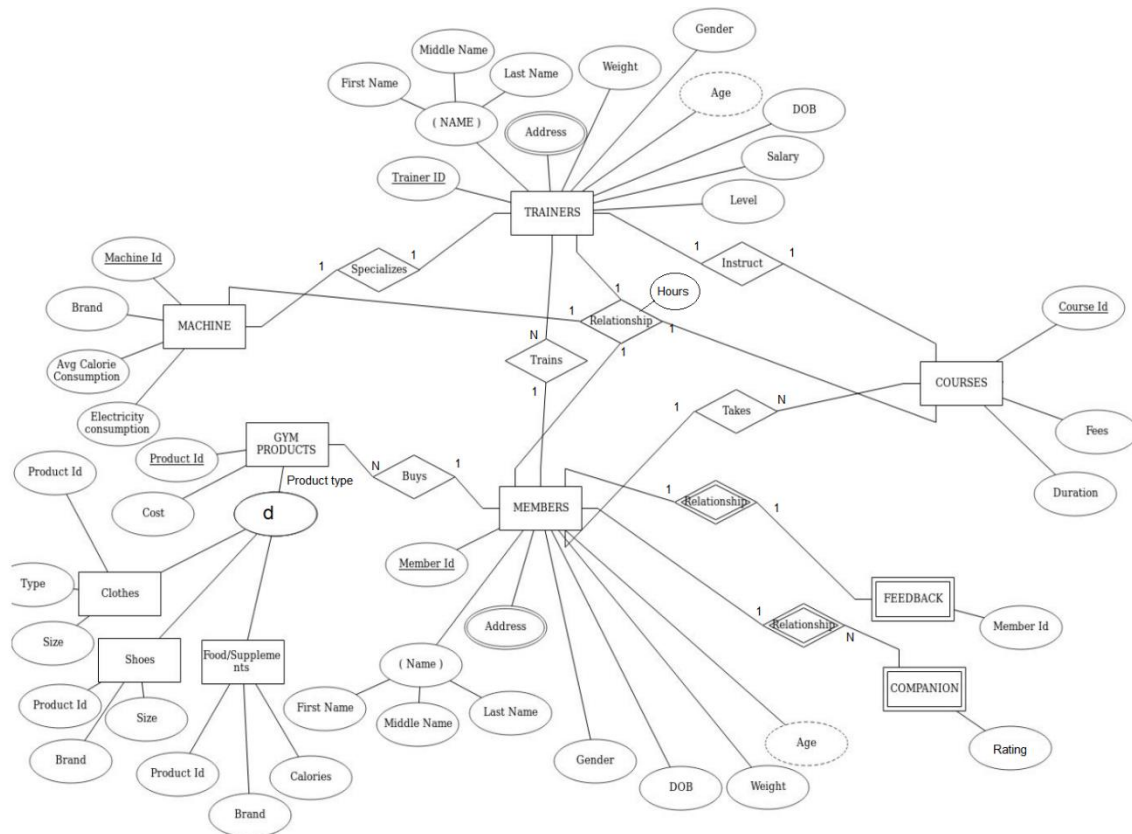# Project phase 3:

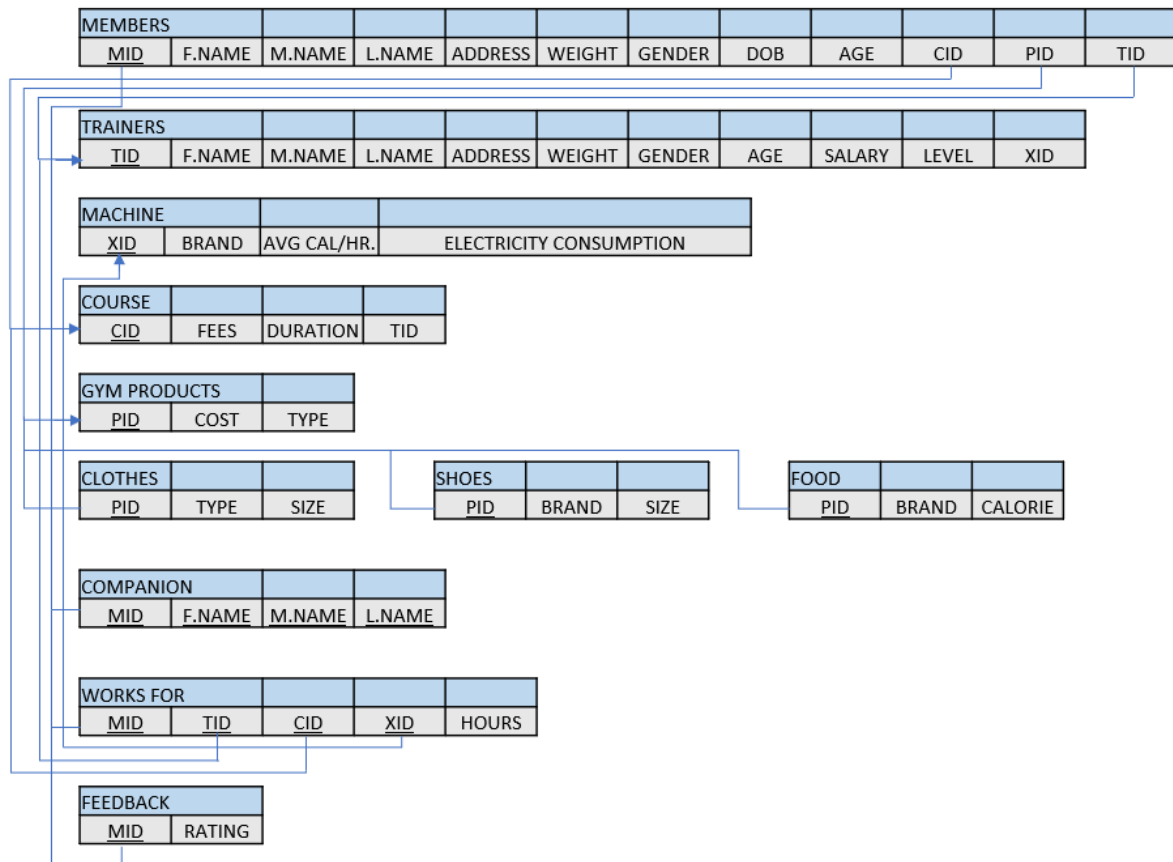**#1 Improved ER model:**

New ER Diagram:

Changes in the ER Diagram:

- Cardinality was not provided
- Changed attribute of Companion to 'RATING'
- 'd' was not written foe subclass. Also subclass type was not written.
- Deleted 'Trainer dealing' attribute of COURSES.

#2 ER model ---> Relational Model:

- Entities are converted into relations including Weak entities also.
- All relations also include some already existing relations whereas for identifying and (n>3) relations new relations are made.
- Like member can take only one course so CID is it attribute, similarly for TID.
- Also, each trainer specialises in one machine only.
- Each course is taken by **One and only one** trainer.
- Subclasses are defined as different relations and their primary key is primary key of their superclass (here its Gym products).

#3 Relational Model:

MEMBERS

MID	F.NAME	M.NAME	L.NAME	ADDRESS	WEIGHT	GENDER	DOB	AGE	CID	PID	TID

TRAINERS

TID	F.NAME	M.NAME	L.NAME	ADDRESS	WEIGHT	GENDER	AGE	SALARY	LEVEL	XID

MACHINE

XID	BRAND	AVG CAL/HR.	ELECTRICITY CONSUMPTION

COURSE

CID	FEES	DURATION	TID

GYM PRODUCTS

PID	COST	TYPE

CLOTHES

PID	TYPE	SIZE

SHOES

PID	BRAND	SIZE

FOOD

PID	BRAND	CALORIE

COMPANION

MID	F.NAME	M.NAME	L.NAME

WORKS FOR

MID	TID	CID	XID	HOURS

FEEDBACK

MID	RATING

#4 Conversion of relational model to 1NF:

We remove all multi-valued & composite attributes and make new relations like follows:

- Remove address attribute from member and trainer.
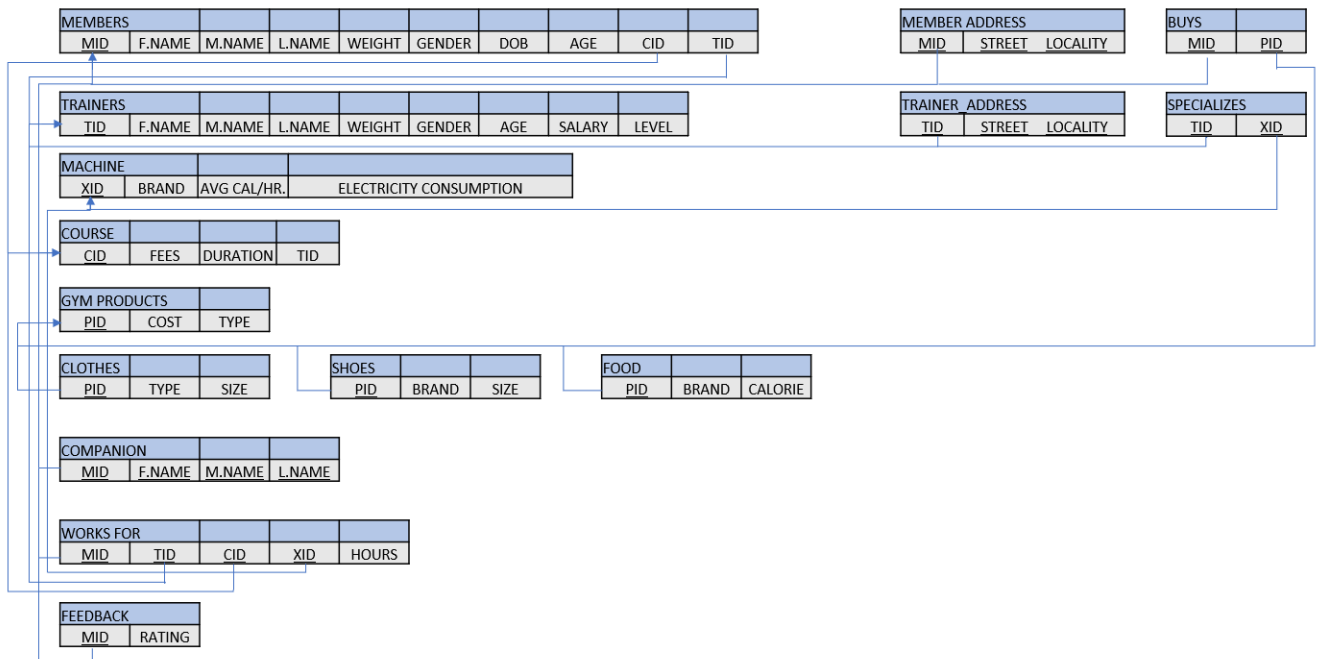- Also two more relations namely 'BUYS' and 'SPECIALIZES'.

#5 Conversion of relational model to 2NF:

No CHANGE.

#6 Conversion of relational model to 3NF:

No CHANGE.

#7 The final 3NF relational model:

MEMBERS

MID	F.NAME	M.NAME	L.NAME	WEIGHT	GENDER	DOB	AGE	CID	TID

MEMBER ADDRESS

MID	STREET	LOCALITY

BUYS

MID	PID

TRAINERS

TID	F.NAME	M.NAME	L.NAME	WEIGHT	GENDER	AGE	SALARY	LEVEL

TRAINER_ADDRESS

TID	STREET	LOCALITY

SPECIALIZES

TID	XID

MACHINE

XID	BRAND	AVG CAL/HR.	ELECTRICITY CONSUMPTION

COURSE

CID	FEES	DURATION	TID

GYM PRODUCTS

PID	COST	TYPE

CLOTHES

PID	TYPE	SIZE

SHOES

PID	BRAND	SIZE

FOOD

PID	BRAND	CALORIE

COMPANION

MID	F.NAME	M.NAME	L.NAME

WORKS FOR

MID	TID	CID	XID	HOURS

FEEDBACK

MID	RATING

#8

MEMBERS

MID	F.NAME	M.NAME	L.NAME	WEIGHT	R	DOB	AGE	CID	TID
X101	alpha	beta	gama	54	M	13.03.01	18	J01	T31

TRAINERS

TID	F.NAME	M.NAME	L.NAME	WEIGHT	R	AGE	Y	LEVEL
T31	jal	mix	fra	70	M	19	13k	1

MACHINE

XID	BRAND	AVG CAL/HR.	ELECTRICITY CONSUMPTION
RX32	Philips	78K	75

E

CID	FEES	DURATION	TID
J01	18K	4 MONTHS	T31

GYM PRODUCTS

PID	COST	TYPE
MI35	8K	JOGGER

S

PID	TYPE	SIZE
MI35	JOGGER	M

SHOES

PID	BRAND	SIZE
MI65	NIKE	US 9

FOOD

PID	BRAND	E
MI01	KELLOGS	2K

COMPANION

MID	F.NAME	M.NAME	L.NAME
X101	RAM	MOHAN	SHARMA

WORKS FOR

MID	TID	CID	XID	HOURS
X101	T31	J01	RX32	2

FEEDBACK

MID	RATING
X101	4

MEMBER ADDRESS

MID	STREET	LOCALITY
X101	111 BAKUL	IIIT H

BUYS

MID	PID
X101	MI01

TRAINER_ADDRE

TID	STREET	LOCALITY
J31	111 BAKUL	IIIT H

SPECIALIZES

TID	XID
J31	RX32