DATA AND APPLICATIONS

PROJECT PHASE 3

TEAM NAME : S&S

MINIWORLD : SUPERMARKET

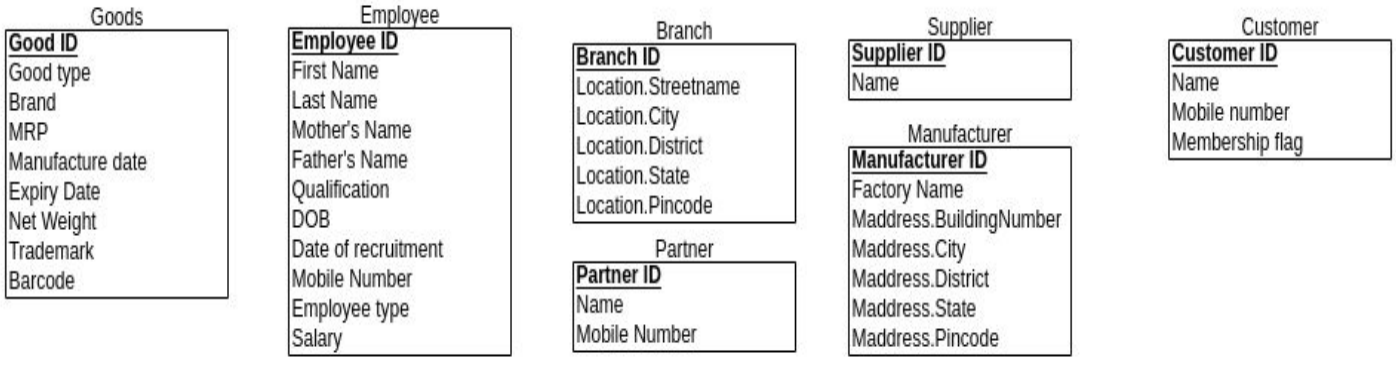
FINAL ER DIAGRAM LINK :

https://drive.google.com/file/d/1wb8DqjuKUlWH-Dq1Y2wfKBKzHqx1Iq4x/view?usp=sharing

RELATIONAL SCHEMA OF THE ER DIAGRAM :

STEP 1:

Mapping all the strong entities.



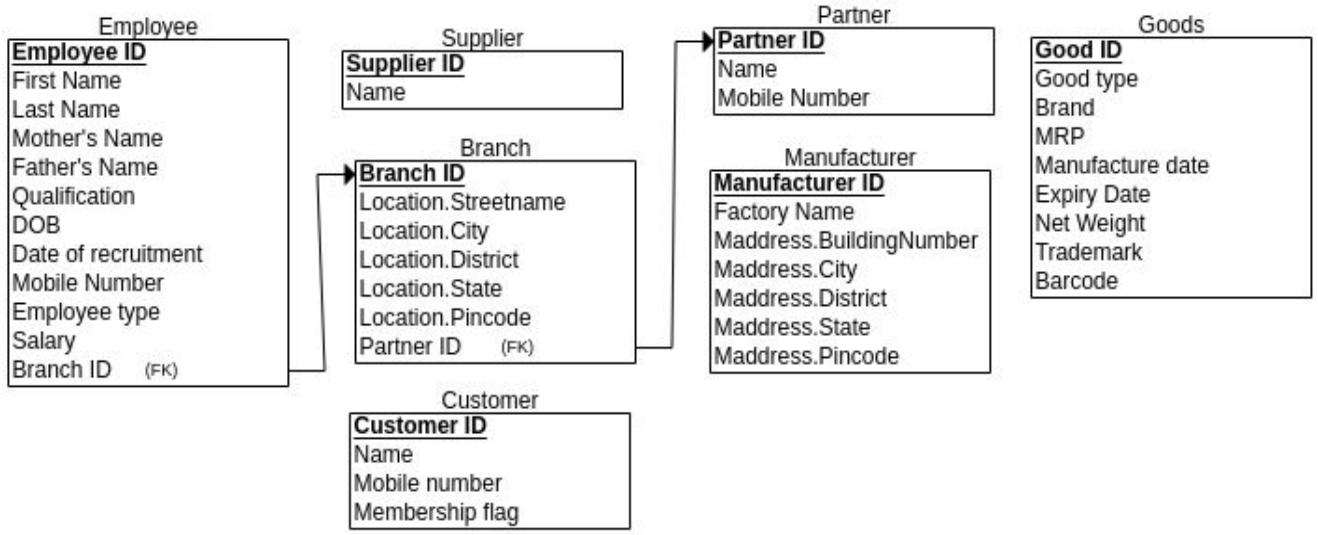
All the simple attributes and components of the composite attributes are inserted leaving the derived attributes (to avoid redundancy) and multivalued attributes.

STEP 2:

Adding the Relationships.

Foreign keys are added to the entities Branch and Partner.
There is a 1:N relationship between Branch and Partner entities as a partner can deal multiple branches but a branch can have only one dealer. (Partnership)
There is a 1:N relationship between Employee and Branch entities as an employee can work only in one branch but a branch can employ multiple employs. (Employment)
The other 2 relationships are

1) SALARY INCREMENT - identifying relationship (Will include after inserting the weak entities)
2) GETS A DISCOUNT - between a subclass and weak entity (Will include after inserting the subclasses)
3) SUPPLY - n>3 relationship

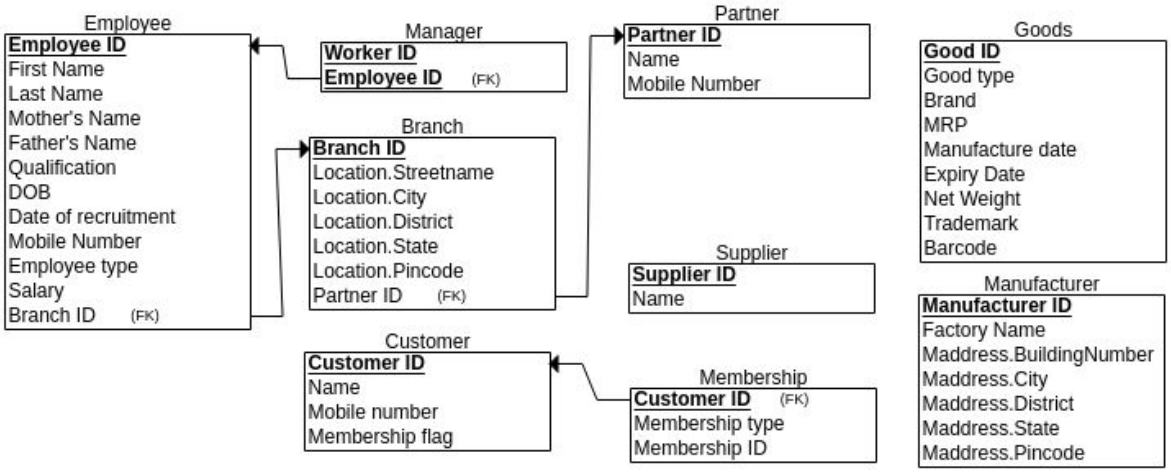


1 and 2 mentioned above are identifying relationships and hence will be added along with the weak entities.

STEP 3:

Adding the Subclasses. (Using 8A Method)

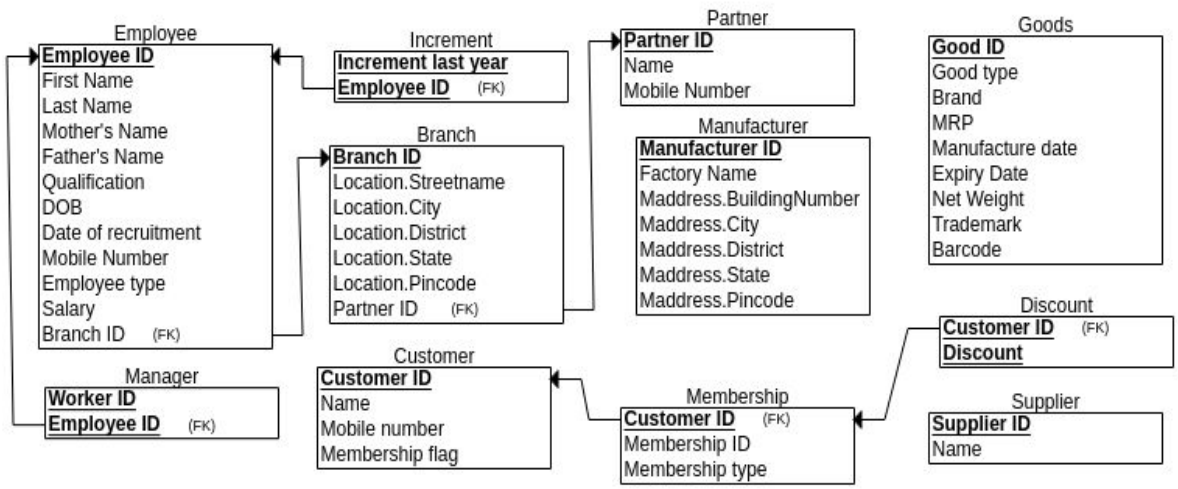
I have added the subclasses before itself as there is a weak entity (DISCOUNT) depending on a subclass(MEMBERSHIP).



Manager is a subclass of the entity Employee based on the attribute Employee type. Employee ID is the foreign key and hence is the primary key too. Now this has a multivalued attribute. So, in order to map it we need to make it as the primary key too.
Membership is the subclass of the Customer entity with customer ID as a foreign key and Membership type and Membership ID (unique attribute) as attributes.

STEP 4:

Added weak entities.



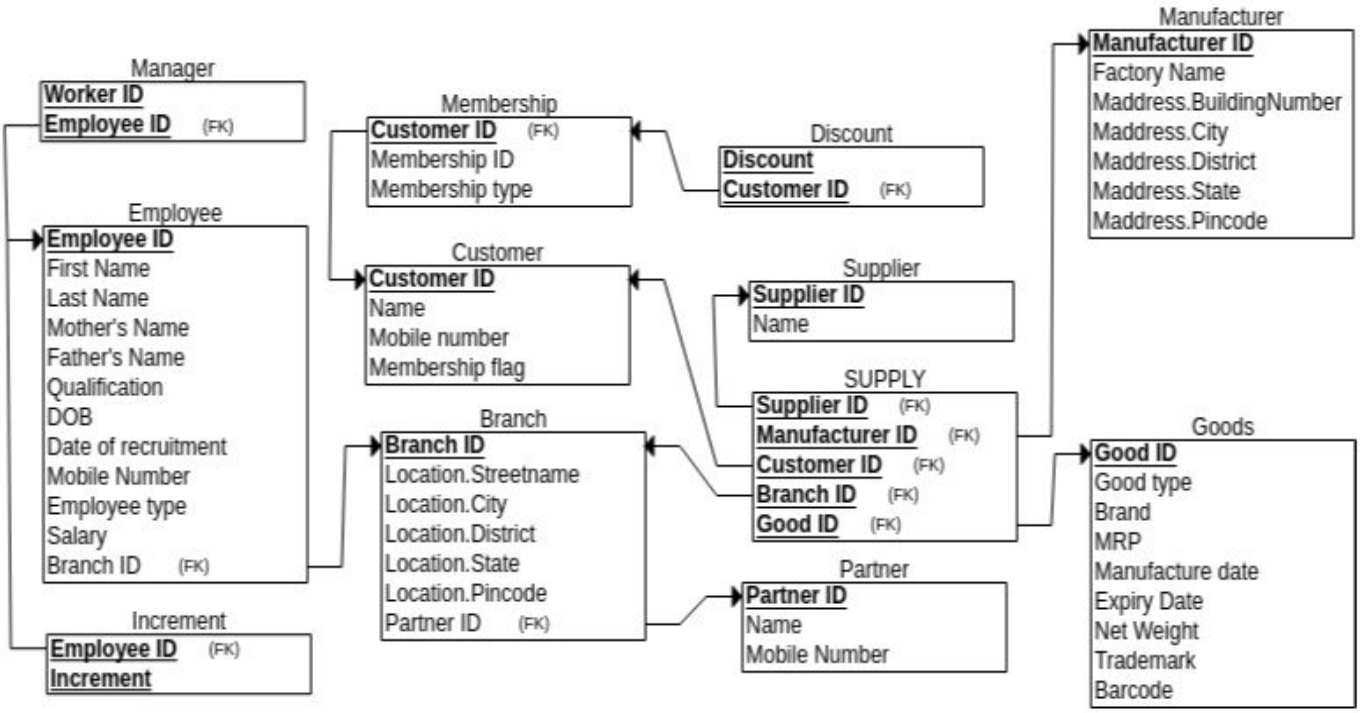
Discount entity is a weak entity depending on the membership entity (Based on the membership type the discount is given to the person). primary key of the Membership entity (Customer ID) becomes the foreign key along with the partial key (Discount), it acts as the primary key of the Discount entity. (This also acts as the mapping of the relationship GETS A DISCOUNT)

Increment entity is a weak entity depending on the Employee entity (Based on the person's experience he/she gets the increment each year).primary key of the Employee entity(Employee ID) becomes the foreign key along with the partial key (Increment last year) it acts as the primary key of the Increment entity. (This also acts as the mapping of the relationship SALARY INCREMENT)

STEP 5:

Added n>3 relationship.

The relationship SUPPLY is related to 5 entities. primary keys of all those entities act as foreign keys and together form the primary key of the relation SUPPLY.



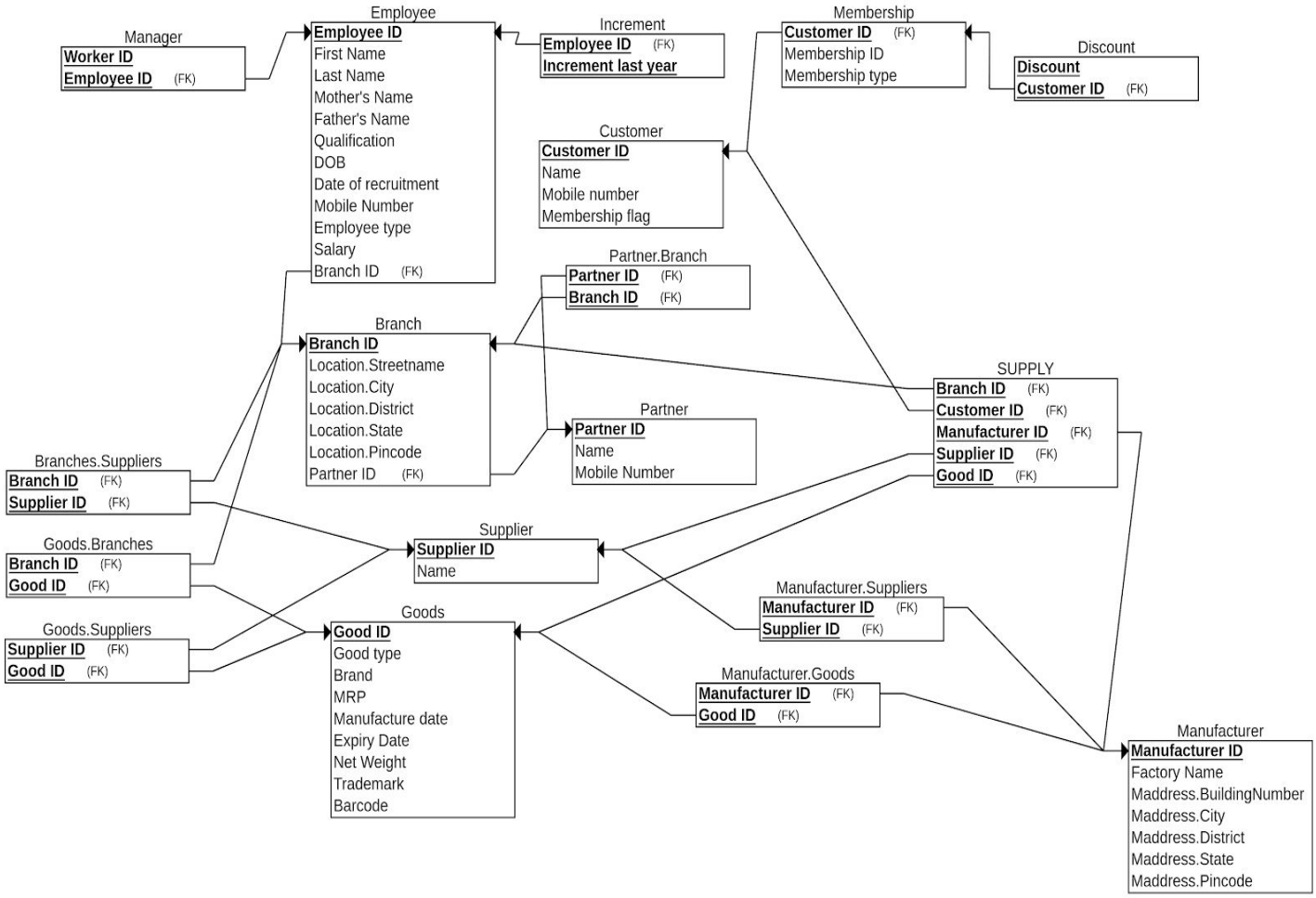
STEP 6:

Added Multivalued attributes.

There are 8 such attributes in which 2 pairs are permutations of each other.

1) PARTNER - branch (that he deal,can be many) - Partner.Branch
2) MANUFACTURER - Goods (that are manufactured) - Manufacturer.Goods
3) MANUFACTURER - Suppliers (who supply from their unit) - Manufacturer.Suppliers
4) BRANCH - Supplier (who supply to that branch) - Branch.Suppliers
5) GOODS - Branches (in which it is available) - Goods.Branches
6) GOODS - Suppliers (who get the goods) - Goods.Suppliers
7) SUPPLIER - Goods (Goods that he/she supplies,can be many)
8) SUPPLIER - Branches supplied to - Branch.Suppliers

Last 2 are the permutations of 5th and 6th Attributes so the Relations created for the 5th and 6th Attributes serves the purpose.

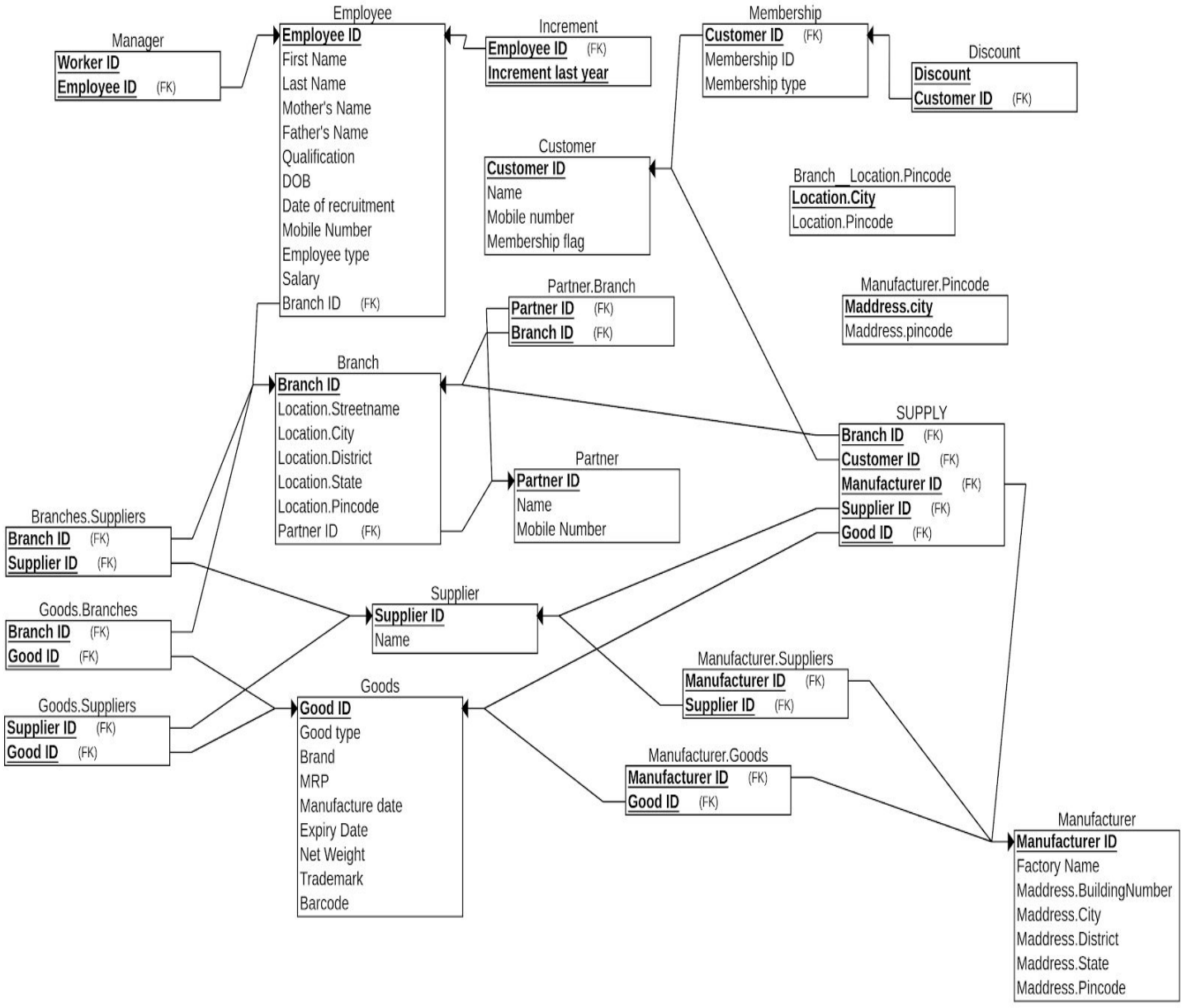


This model violates 3NF in case of the pin code of the branch and the manufacturer address as pin code depends on the city.

STEP 7:

Elimination of the functional dependency.

The relations Branch_Location.Pincode and Manufacturer.Pincode eliminate the violations.



FINAL RELATIONAL MODEL LINK :

https://drive.google.com/file/d/1Gyqf-q8GH9wPzNTjAavA-b6NJ-Sdx_5j/view?usp=sharing

EXAMPLE TUPLES FOR EACH RELATION :

MEMBERSHIP:

Membership ID	Membership type	Customer ID
90001	A	80052
90002	B	80002
90003	C	80004

DISCOUNT:

Customer ID	Discount
80052	2000
80002	1000
80004	500

BRANCH:

Branch ID	Location.Streetname	Location.City	Location.District	Location.State	Partner ID(FK)
10001	Gachibowli circle	Hyderabad	Hyderabad	Telangana	20001
10002	Dr.Radhakrishnan Nagar (South)	Chennai	Chennai	Tamil Nadu	20002
10003	Padma Nagar	Karimnagar	Karimnagar	Telangana	20002

BRANCH.PINCODE

Location.city	Location.pincode
Hyderabad	500032
Chennai	600036
Karimnagar	505001

EMPLOYEE:

Employee ID	First Name	Last Name	Mother's Name	Father's name	Qualification	DOB	Date.of Recruitment	Mobile number	Employee Type	Salary	Branch ID
70001	Sai	AA	Sruthi	Kiran	10th	10-06-1989	19-11-2012	9246985555	Manager	25000	10001
70002	Ravi	BB	Harika	Sudhir	B.Tech	9-07-1992	7-08-2015	9444554478	Worker	10000	10001
70003	Sree	CC	Priya	Teja	BA	19-12-1995	8-07-2014	9454154526	Worker	9000	10002

MANAGER:

Employee ID	Worker ID
70001	70002
70001	70002

MANUFACTURER:

Manufacturer ID	Factory name	Maddress.building number	Maddress.city	Maddresss. District	Maddress.State
60001	Himalaya Drug company	Plot no. 16/A	Jeedimetla	Hyderabad	Telangana
60002	Herbal concepts health care PVT.LTD	Plot no. 2	Ranipur	Haridwar	Uttarakhand

MANUFACTURER.PINCODE:

Maddress.city	Maddress.Pincode
Jeedimetla	500055
Ranipur	249403

CUSTOMER:

Customer ID	Name	Mobile number	Membership Flag
80052	Anushree	9445415425	1
80002	Rahul	9425426221	1
80004	Kowshik	9742252221	1
80005	Kushal	9841222221	0

SUPPLIER:

Supplier ID	Name
50001	Raju
50002	Somesh
50003	Venkat

GOODS:

Good ID	Good type	Brand	MRP	Manufactured Date	Expiry Date	Net Weight	Trademark
110001	Cosmetics	Himalaya	120	22.10.19	22.10.21	100g	Himalaya Global Holdings Ltd
110002	Cosmetics	Himalaya	150	22.10.19	22.10.21	150g	Himalaya Global Holdings Ltd
110003	Cosmetics	Himalaya	250	22.10.19	22.10.21	250g	Himalaya Global Holdings Ltd
110004	Cosmetics	Ayush	50	17.10.19	17.10.21	80g	Hindustan Unilever Ltd
110005	Cosmetics	Ayush	100	17.10.19	17.10.21	100g	Hindustan Unilever Ltd

INCREMENT:

Employee ID	increment received last year
70001	1500
70002	800
70003	600

PARTNER:

Partner ID	Name
20001	Pratap
20002	Sumanth

Partner.Branch: (A Partner can deal multiple Branches)

Partner ID	Branch ID
20001	10001
20002	10002
20002	10003

Branches.Suppliers : (A Supplier can supply to any no of branches A branch can have any no of suppliers)

Branch ID	Supplier ID
10001	50001
10001	50002
10002	50002
10002	50003
10003	50001

Goods.Branches : (A good can be present in many branches A branch can have many goods)

Good ID	Branch ID
110001	10001
110001	10002
110002	10002
110003	10003
110004	10002
110005	10002

Goods.Suppliers

Supplier ID	Good ID
50001	110001
50001	110002
50001	110003
50002	110001
50002	110002
50002	110003
50003	110004
50003	110005

Manufacturer.Supplier : (A manufacturer can have many Suppliers)

Manufacturer ID	Supplier ID
60001	50001
60001	50002
60002	50003

Manufacturer.Goods : (A manufacturer can produce many goods)

Manufacturer ID	Good ID
60001	110001
60001	110002
60001	110003
60002	110004
60002	110005

SUPPLY:

Branch ID	Customer ID	Manufacturer ID	Supplier ID	Good ID
10001	80002	60001	50001	110001
10001	80004	60001	50002	110001
10002	80005	60001	50002	110001
10002	80005	60001	50002	110002
10002	80005	60002	50003	110004
10002	80005	60002	50003	110005
10003	80052	60001	50001	110003

CHANGES MADE IN THE ER DIAGRAM :

1) We haven't considered the Membership entity as a weak entity according to the SRS but the other team have made it a weak entity. We instead considered it as a subclass of the CUSTOMER entity. And hence removed the other repeating attributes of Membership entity; Name and Mobile Number. At the same time Membership type attribute of CUSTOMER entity is also removed for the same reason.

2) The redundant 'Address' attributes of GOODS entity and EMPLOYEE entity were removed (considering them unimportant attributes).

3) Dealer attribute of the BRANCH entity is removed as it is a foreign key and is redundant as there is already a relationship between branch and partner entities.

4) One of the attributes of the GOODS entity ; SUPPLIERS WHO GET THE GOODS is made as a multivalued attribute.

5) ‘Received from’ attribute of the SUPPLIER is also removed considering it redundant due to the multivalued attribute SUPPLIERS of the MANUFACTURER entity.

6) Removed the 2 foreign keys of the weak attributes ; DISCOUNT entity and INCOME entity and inserted the identifying relationships for them.

7) Experience and Rank of the Employee entity are made as derived attributes as they can be derived from the date of recruitment.

8) Due to a small misconception the other group has put a different relationship for the DISCOUNT entity. They considered the discount to be goods specific but we have clearly mentioned that it is membership specific so we have changed it.

9) Renamed the relationship ‘Good supply and selling’ as ‘Supply’.

10) They have an attribute ‘Membership points’ to the Membership entity due to the misconception mentioned in (8). We removed it.