NORMALIZATION

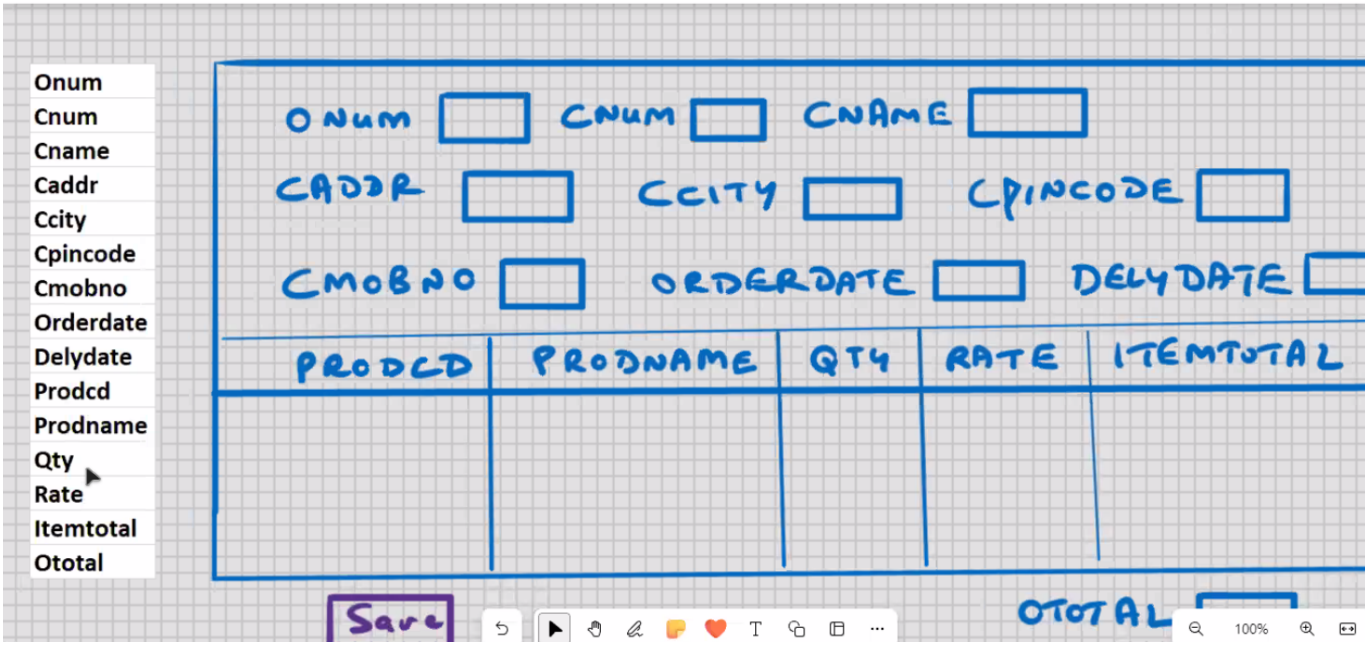
- applicable for RDBMS (eg. MySQL) and ORDBMS (eg. ORACLE).
- Concept of table design
- RDBMS -> 1st to 4th Normal form
- ORDBMS -> 1st to 9th Normal Form
- what tables to create, structures, column, datatype, widths, constraints
- based on user requirnments
- it's part of a design phase (min 1/6 time should be spend on designing AND 25% - 33% on coding as per sameer sir)
- Aim of Normalization :- a. to have an "efficient" table structure b. avoid the data redundancy (avoid the unnecessory duplication of data) c. to reduce the problems of insert, update, and delete
- Normalization is done from an input prespective.
- Normalization is done from a Forms prespective (front end).
- IMP
- VIEW THE ENTIRE APPLICATION ON A PER-TRANSACTION BASIS, AND YOU NORMALISE EACH TRANSACTION SEPARATELY.
- e.g. CUSTOMER_PLACES_AN_ORDER, CUSTOMER_CANCELS_THE_ORDER, GOODS_ARE_DELIVERS, CUSTOMER_MAKES_PAYMENT, CUSTOMER_TERETURNS_THE_GOODS etc.

lets take an real life example

CUSTOMER_PLACES_AN_ORDER

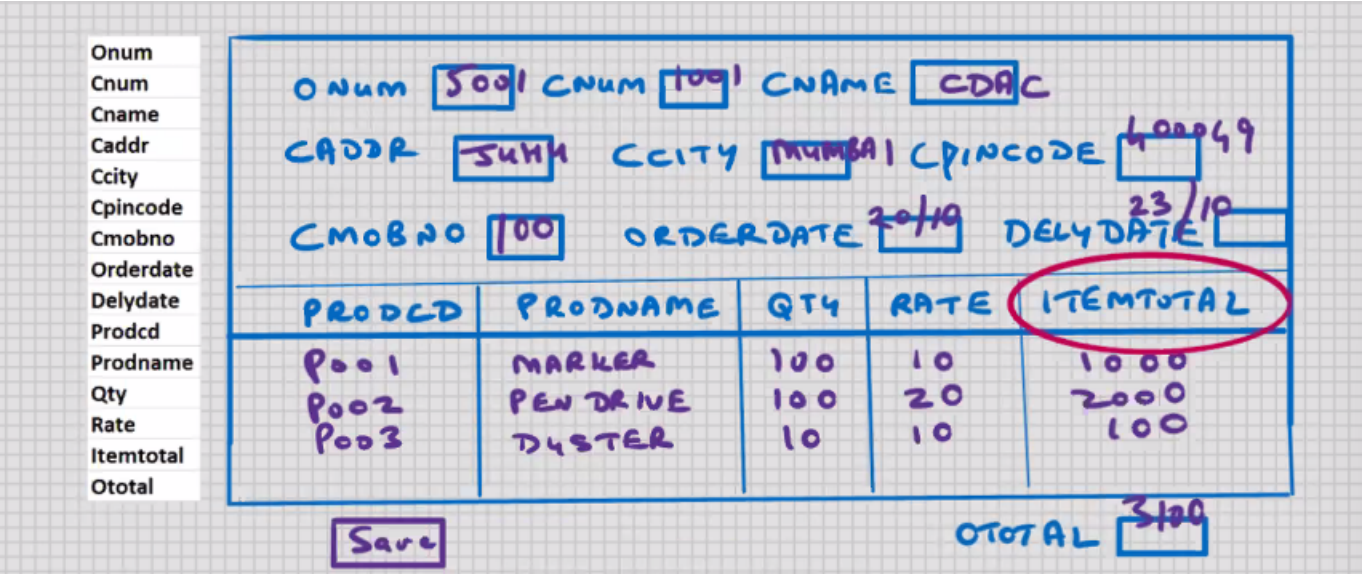
Getting ready for Normalization:-

- data which flipkart stores

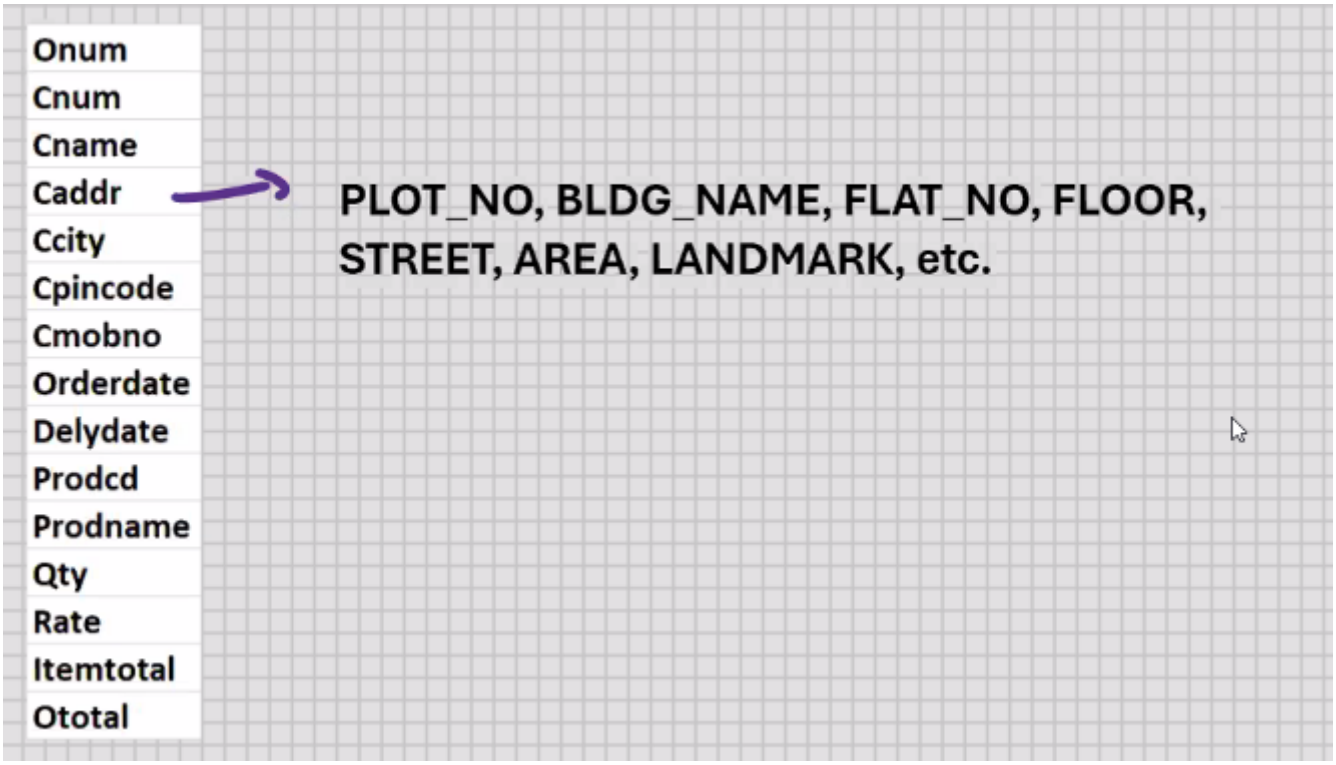


1. For a given transaction , make a list of fields

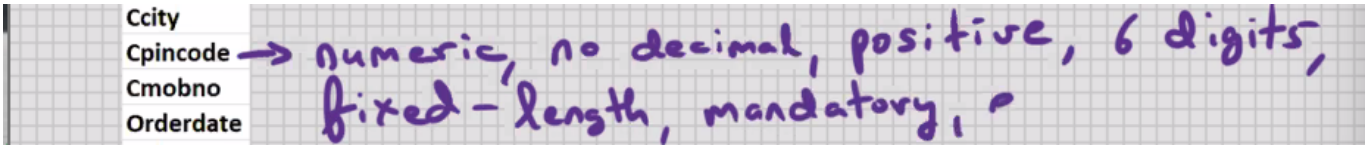
2. Ask client for some sample data



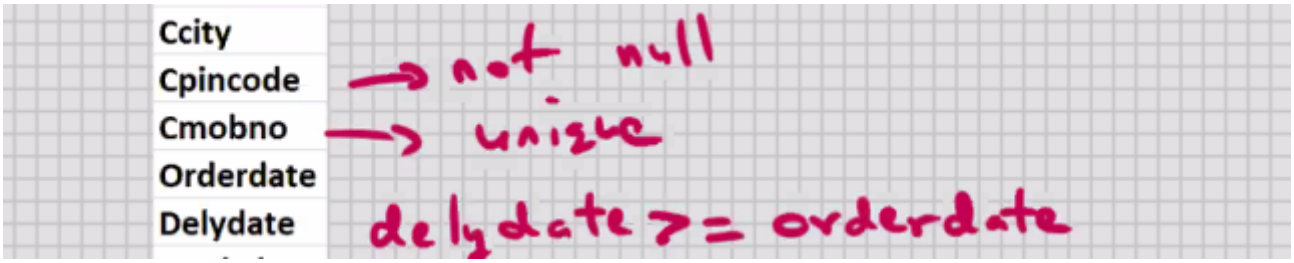
3. With the permission and involvement of client, strive for atomicity (column is divided into sub-columns, and sub-columns are divided into sub-sub_columns)
    e.g.



4. For every column, make a list of column properties;
e.g.



5. GET CLIENT SIGN-OFF.
6. END OF CLIENT INVOLVEMENT/ INTERACTION
7. Assign the datatypr for each column
8. Assign the width for each column
9. Assign the not null, unique and check constraints



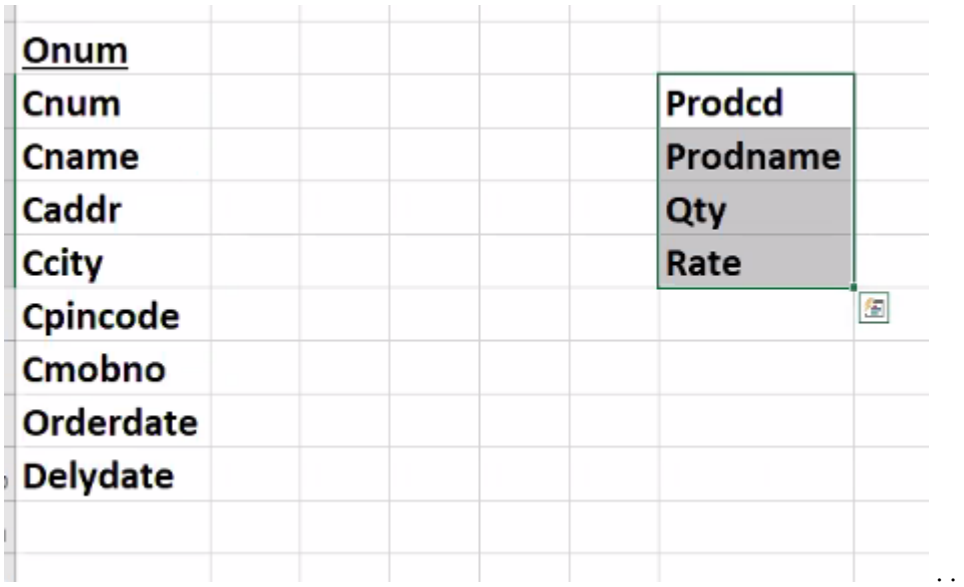
10. For all practical purposes, u can have a single table with all these columns

11. Remove the computed column (e,g, itemtotal, ototal)
12. Key element will be Primary key of thei table

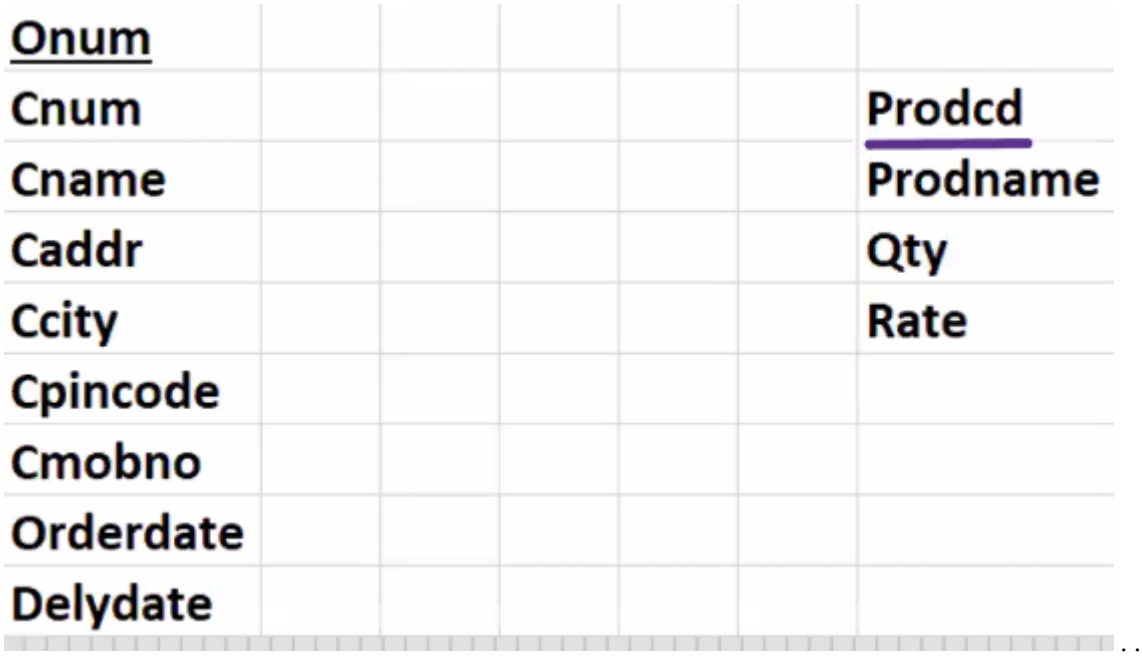
- At this point, the data is Un-Normalised form (UNF)
- Un-Normalised form -> Starting point of NORMALISATION

NORMALISATION

1. Remove the repeating group into a new table



2. Key element will be the primary key of new table



3. (This step may or may not be required) Add the primary key of orignal table to the new table to give u a Composit Primary Key.

Onum						Onum
Cnum						Prodcd
Cname						Prodname
Caddr						Qty
Ccity						Rate
Cpincode						
Cmobno						
Orderdate						
Delydate						

The above three steps are to be repeated gain and again infinitey till u canot normalize it any further

At this point

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FIRST NORMAL FORM ( FNF ) ( SINGLE NORMAL FORM ) ( 1NF ) :-
- Repeating groups are removed from the table design.
QUE   - 1 isto many relationship is always encountered here
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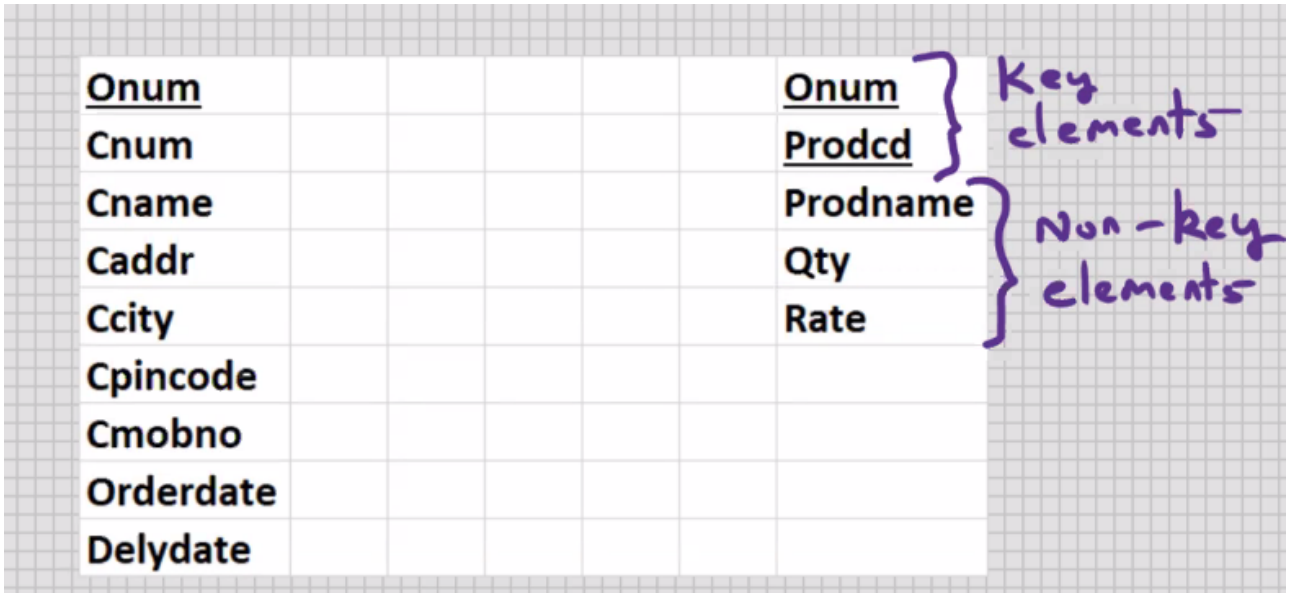
` DEPT and EMP tables are in First Normal Form

4. Only the tables with composit primary key emelents are examined



5. Those non-key elements that r not dependent on the entire composit primary key, they are to be removed into a new table.

Onum						Onum			
Cnum						Prodcd			Prodname
Cname						Qty			Rate
Caddr									
Ccity									
Cpincode									
Cmobno									
Orderdate									
Delydate									

6. Key element on which originally dependent, it is to be added to the new table and it will be the primary key of that new table.

- The above three steps are to be repeated gain and again infinitey till u canot normalize it any further

SECOND NORMAL FORM (2NF)

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- Every column is functionally dependent on Primary key
- FUNCTIONAL DEPENDENCY -> Without Primary key, that column cannot function
-
```

7. only the non-key elements are examined for inter-dependencies

8. Inter-dependent columns are to be removed into a new table

Onum			Cnum			Onum			Prodcd
Orderdate			Cname			Prodcd			Prodname
Delydate			Caddr			Qty			Rate
			Ccity						
			Cpincode						
			Cmobno						

9. Key-element will be the primary key of the new table , and the primary key of the new table,that column, it is the be retained in the orignal table for relationship purposes.

Onum	Cnum	Onum	Prodcd
Orderdate	Cname	Prodcd	Prodname
Delydate	Caddr	Qty	Rate
Cnum	Ccity		
	Cpincode		
	Cmobno		

```
key of new table, that column, it is to be retained in the original table
for relationship purposes
*       above 3 steps are to be repeated inifnitely till you cannot
        Normalise any further
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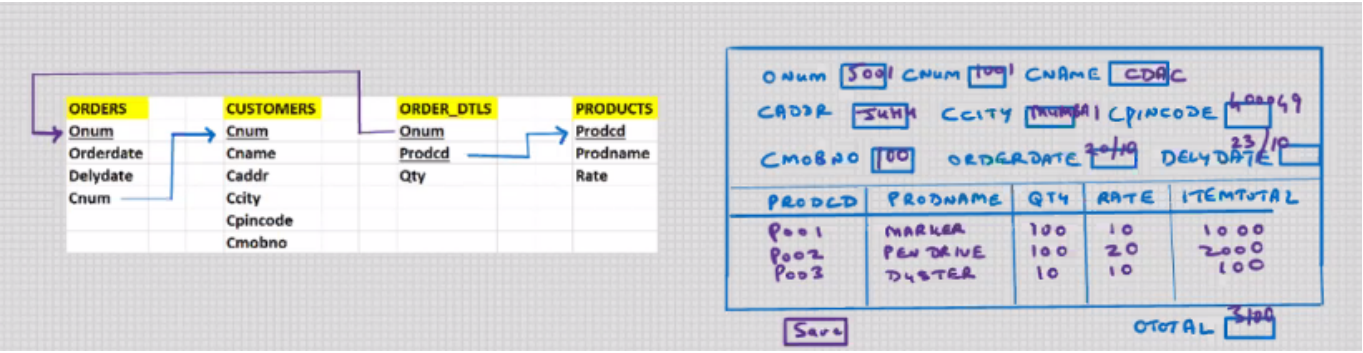
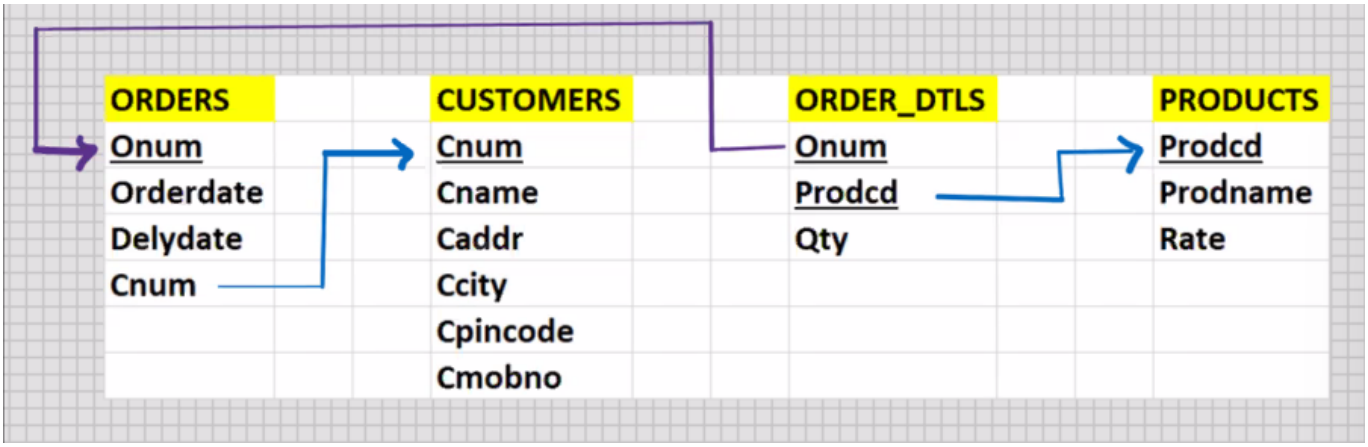
THIRD NORMAL FORM (3NF)



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Normalisation

*       what tables to create, structures, columns, datatypes, widths,
        constraints
*       Primary key is a by-product of Normalisation

Post-Normalisation
*       implement Extension columns
*       reserve some columns for logs of DML operations
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