Find functional dependency in the following table

courseid	cname	duration	capacity	course start date	facultyid	fname	subject	list of subjects	gitrepo	subject duration	subject startdate	

1

one faculty can teach many subjects.

different subject can be taught to one course by different faculties.

cid,course startdate,subject--→subject start date

courseid---→ cname,duaration,capacity

facultyid-→fname, gitrepo,list of subject

subject---→subject duration

courseid	cname	duration	capacity	course start date	facultyid	fname	subject	gitrepo	subject duration	subject startdate	

to make the table in 1 NF we need to remove list of subjects, and create table as follows.

12--→java,c++,python,DBt

fid	sub1	sub2	sub3	sub4

12-→ java c++ python dbt

or

fid	subject

12 java

12 c++

12 python

12 dbt

13 java

to check whether the table is in 2 NF

1. it is in 1 NF

   courseid---→ cname,duaration,capacity
   coursestart date

courseid+course start date--→ subject start date,fid,fname,subject,subject duration,subjectstart date,git repo

courseid	cname	capacity	duration

courseid	course start date	facultyid	fname	subject	gitrepo	subject duration	subject startdate	

fid	subject

check for 3NF

1. The tables are in 2NF

courseid+start date-→fid--→fname,gitrepo

courseid+start date ->subject---→subject duration

course_faculty

courseid	course start date	facultyid	subject	subject startdate

faculty

fid	fname	gitrepo

subject

subject	subject duration

course

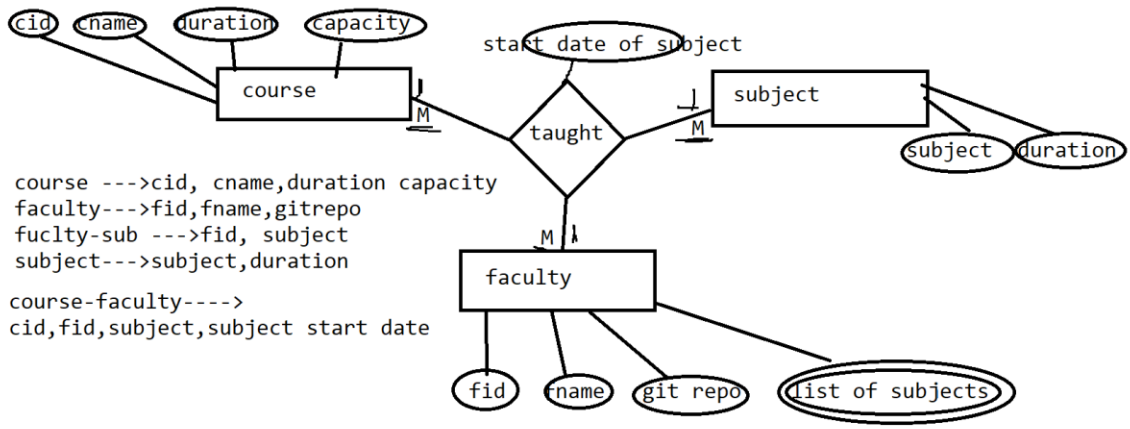
courseid	cname	capacity	duration

faculty

fid	subject

In ER diagram 3 types of relations can be there

one-one	If the relation is one-one then any one side key can be added in other
one-Many	if the relation is one to many, then add key of one side to many side table
Many-Many	if relation is many to many then create 3 rd table and add primary key of both sides, and add all relation attributes



Example 1:

Proj Code	Proj Type	Proj Desc	Empno	Ename	Grade	Sal scale	Proj Join Date	Alloc Time
001	APP	LNG	46	JONES	A1	5	12/1/1998	24
001	APP	LNG	92	SMITH	A2	4	2/1/1999	24
001	APP	LNG	96	BLACK	B1	9	2/1/1999	18
004	MAI	SHO	72	JACK	A2	4	2/4/1999	6
004	MAI	SHO	92	SMITH	A2	4	5/5/1999	6

It is in 1NF

is it in 2NF

to check partial dependency

proj code--→ proj type, project description

empno-→ename, grade,sal

projcode+empno-→ joining date, allocation time

project

Proj Code	Proj Type	Proj Desc

001	APP	LNG
001	APP	LNG
001	APP	LNG
004	MAI	SHO
004	MAI	SHO

employee

Empno	Ename	Grade	Sal scale
46	JONES	A1	5
92	SMITH	A2	4
96	BLACK	B1	9
72	JACK	A2	4
92	SMITH	A2	4

proj emp

Proj Code	Empno	Proj Join Date	Alloc Time
001	46	12/1/1998	24
001	92	2/1/1999	24
001	96	2/1/1999	18
004	72	2/4/1999	6
004	92	5/5/1999	6

following table is not in 3 NF

employee

Empno	Ename	Grade	Sal scale
46	JONES	A1	5
92	SMITH	A2	4
96	BLACK	B1	9
72	JACK	A2	4
92	SMITH	A2	4

empno-→grade-→ salary scale

Empno	Ename	Grade
46	JONES	A1
92	SMITH	A2
96	BLACK	B1
72	JACK	A2
92	SMITH	A2

grade

Grade	Sal scale
A1	5
A2	4
B1	9
A2	4
A2	4

- **Orderno**
- **Orderdate**
- **Itemno**
- **Qty**
- **Price**
- **Cname**
- **Custno**
- **Email**
- **Orderamt**
- **Salespersonno**
- **Salespersonname**
- **Locationid** ----------**location from where item dispatched**
- **Location name**

One customer can place many order
One order contains many items
One order will be managed by one salesperson
One order belong to one customer
One order can be dispatched from different location

ORDER ID	DATE	ITEMNO	QTY	PRICE	CID	CNAME	EMAIL	AMT	SID	SNAME	LID	LNAME
1	10 APR	100	3	300	100	Kishori	aa@dkj	4900	S1	xxx	1	delhi
1	10 APR	200	4	1000	100	kishori	aa@dkj	4900	S1	xxx	2	Mumbai
2	11apr	100	4	200	101	Revati	r@wej	5000	S2	yyy	1	Delhi
2	11 apr	200			101	Revati						

Is it in 1NF------yes

Is it in 2NF

1. It should be in 1 NF ----yes
2. Check for partial dependency
   Prime attribute ----- orderno, item no
   Orderno---→order date,cname,cno,email,orderamt,salespersonid,salespersonname,
   Itemno
   orderno, item no---→qty,price,locationid, location name

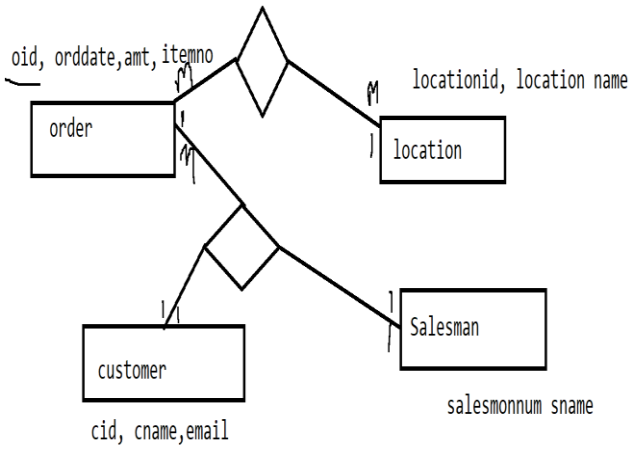
   order
   (Orderno,order date,cname,cno,email,orderamt,salespersonid,salespersonname

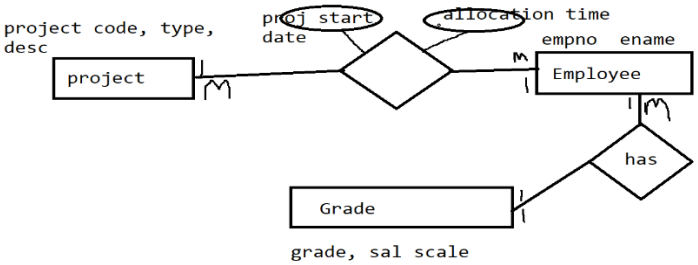
   Order_item
   (orderno, item no,qty,price,locationid, location name)
   locationid--→location name
   Check for 3NF
   (Orderno,order date,cname,cno,email,orderamt,salespersonid,salespersonname
   Is it in 3 NF ---no
   Cno--→cname,email
   Salesperson id-→sname

   Customer
   (cno,cname,email)
   Salesman
   (Salesperson id,sname)

   order
   (Orderno,order date, cno, ,orderamt,salespersonid)

)
   Order_item
   (orderno, item no,qty,price,locationid)





Types of models

Conceptual model
If you draw ER diagram with entity name and relation

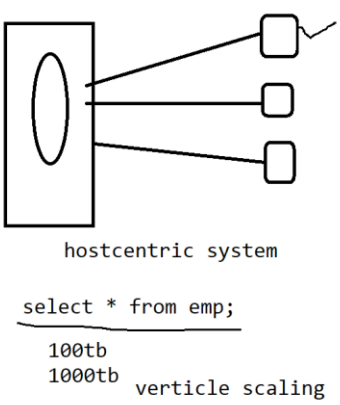
Logical model
In conceptual model if you add list of attribute then it is logical model

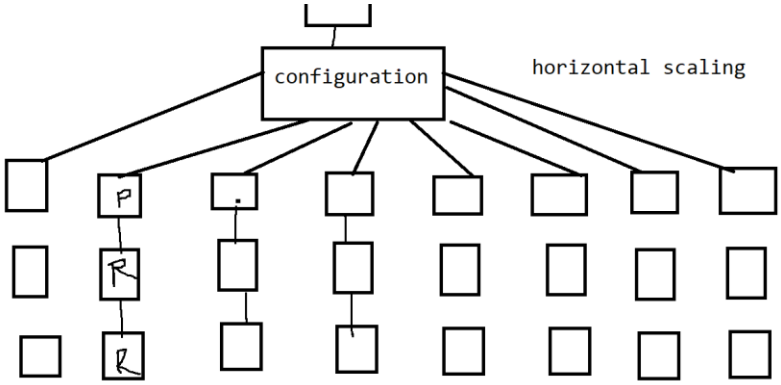
Physical model
In logical model if you define data types of each attribute, primary key,foreign key

MongoDB

It is noSQL database

RDBMS	NOSQL
Structured	unstructured
Hostcentric	Distributed
Slow as compared to nosql	fast as compared to sql
less available	highly available
sharding will not be their	sharding is available





Terminologies

RDBMS	NOSQL(MongoDB)
Database	database
table	collection
row / record / tuple	document
primary key	primary key, but the name is always _id
joins are available	No joins are available, lot of redundancy of data is there
aggregate functions group by	aggregation pipeline available

install monogoDB

In mongodb data can be stored as document, stored in BSON format

{empno:123,

ename:'Rajan',

desg:'manager',

dept:{depetno:1,dname:'xxx'},

project:[{name:'x',duration:4},

{name:'y',duration:2},

{name:'x',duration:60}],

hobbies:['reading','dancing'],

married:True

}

to access project duration at 1 st index position

project.1.duration

to access hobbies at 1 st index position

hobbies.1

to install mongodb

1. download mongodb setup
    a. community server version 6.0

       to download mongo db

       https://www.mongodb.com/try/download/community

    b. to download mongo shell
       https://www.mongodb.com/try/download/shell

    c. to download mongodb commandline tools

       https://www.mongodb.com/try/download/database-tools

step 1

open command prompt to start the server---start the server

c:\system32> mongod --dbpath e:\data7

open another command prompt----to start the client

c:\system32>mongosh

to import data

open third command prompt----to load data

c:\system32> mongoimport --db iacsd0324 --collection restaurent --file D:\mongodb\JsonFiles\samplerestaurent.json

c:\system32> mongoimport --db iacsd0324 --collection movie --file D:\mongodb\JsonFiles\movie.json

to export the data

c:\system32> mongoexport --db iacsd0324 --collection movie --out D:\mongodb\JsonFiles\moviedata.json