

3/2/2020

employee.id, first.name, last.name, email, phone.no.,
hire.date, job.id, salary, commission, manager.id, dept.id

- select dept.id, count(*) from Employee
GROUP BY dept.id;
- Select $\sum(\text{salary})$ from Employee GROUP BY by
dept.id;
- Select dept.id, count(*), sum(salary) from Employee
GROUP BY dept.id;

Retrieve color.id and no. of shapes in each
color.id.

- * Select color.id, count(*) from shapes
GROUP BY color.id;
- List color.id and no. of shapes in each color.id
with no. of shapes > 1.

Select color.id, count(*) from shapes
GROUP BY color.id having count(*) > 1;

- * List the no. of circles or squares in each color
select shape-name, count(*) from shapes
GROUP BY shape-name having shape-name IN(circles,
 squares);
- * List the no. of circles or squares in each color
having atleast one shape.
- * Select shape-name, count(*) from shapes
where

DISTINCT Clause:

- In the execution of a select stmt. does not prevent repeated values from appearing in the output.
- The distinct keyword when used with select stmt. eliminates duplicates.

Syntax:

Select DISTINCT <column name>

From tablename

Where <conditions>;

Select Distinct column1, column2
from tablename ;

6 The distinct keyword can also be used to fetch unique combination of rows in the whole table

Use of distinct with aggregate functⁿs.

Select count(Distinct columnname)
From tablename ;

Consider the following schema

Sailors (sid : integer , sname : string ,
rating : integer , age : real)

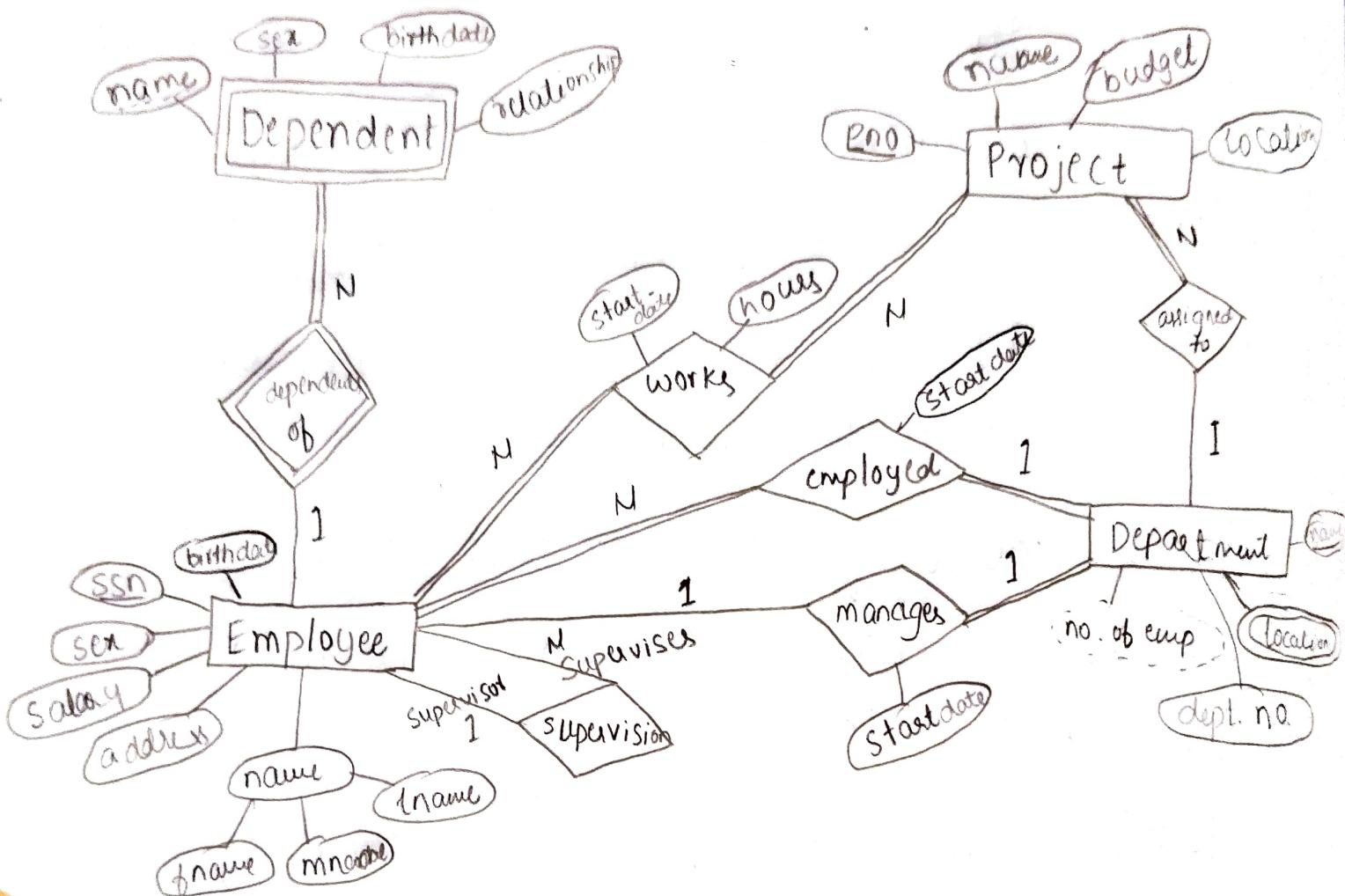
Boats (boat.id : integer , bname : string ,
color : string)

Reserves (sid : integer , bid : integer , day : date)

1. Write SQL queries to create table and add records.
2. Retrieve details of sailors having a rating of > 5
3. Retrieve sailor name and rating of those sailors whose age is betⁿ 21 and 25
4. Retrieve id and name of all boats whose color starts with either B or R
5. Select count of boats of each color.
6. Retrieve the no. reservations made by a particular sailor.
7. Retrieve the total no. of reservation for each boat
8. Retrieve the max, min and avg. rating of all sailors
9. Retrieve details of reservations. Sort the details date wise

10/21/2020

ER to Relational Mapping:



Goals:

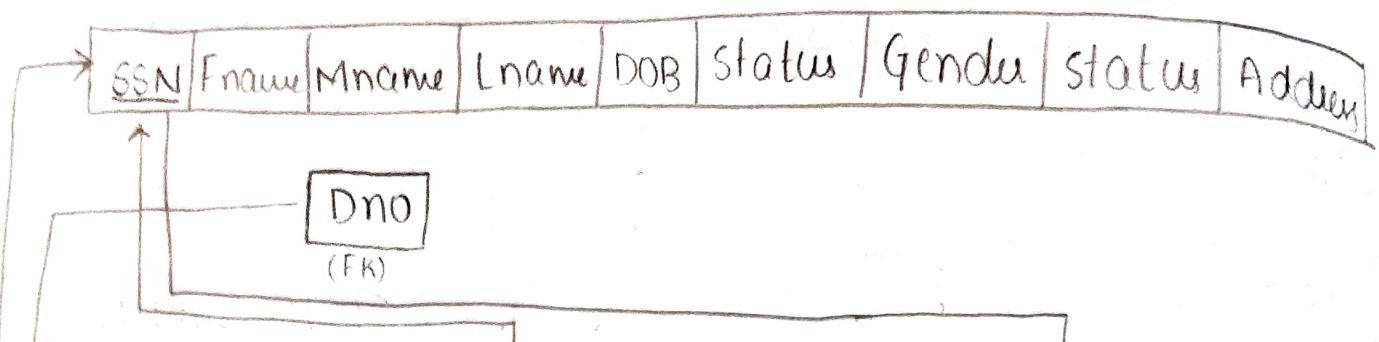
1. Represent as much info. as possible (including values of attributes)
2. Preserve various constraints to best possible ext. (impossible to represent: 1:10 or n-array relationship)
3. Prevent null values.

PROCEDURE for mapping ER to Relational

- The mapping procedure for mapping an ER diagram to a schema diagram consists of 7 basic steps.
- 1 Mapping of regular entity types
 - 2 Mapping of weak entity types
 - 3 Mapping of binary 1:1 relation types
 - 4 Mapping of binary 1:N relation types.
 - 5 Mapping of binary M:N relationship type
 - 6 Mapping of multivalued attributes
 - 7 Mapping of N-ary relationship types

EMPLO

EMPLOYEE



DEPARTMENT :

Dno	Dname	ESSN	Mgr. Startdate
		(FK)	

PROJECT

name	budget	location	Pno	Dno
				(FK)

DEPENDENT

dname	gender	DOB	relationship	ESSN
				(FK)

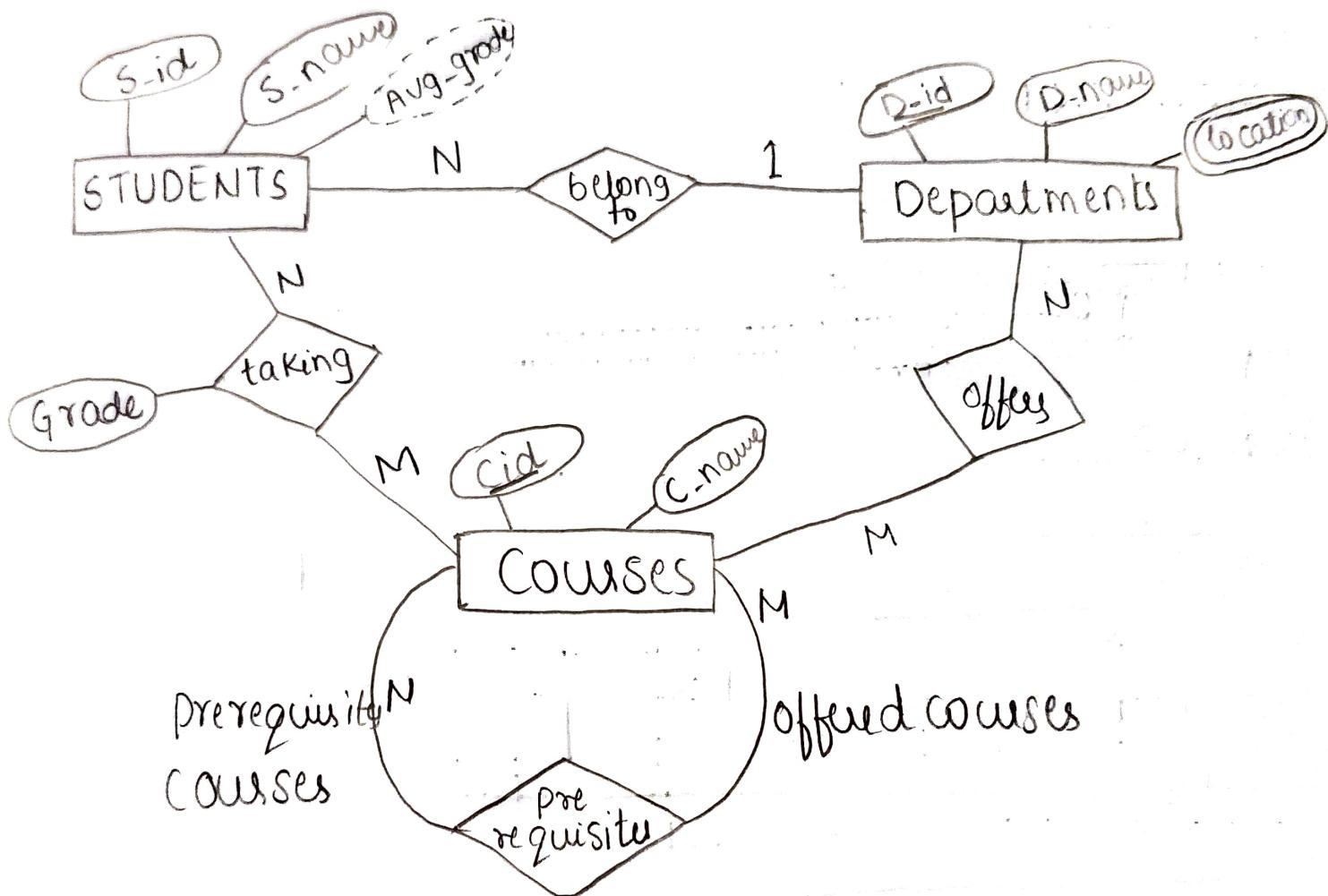
WORKS

SSN	Pno	Startdate	hours
FK	FK		

LOCATION :

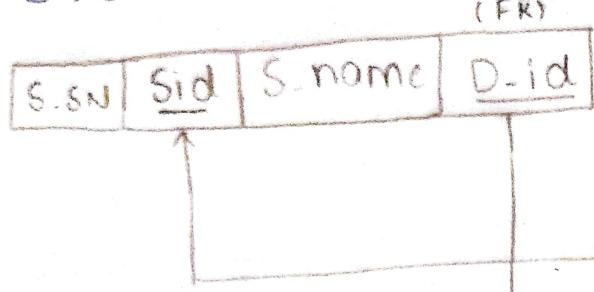
location	Dno

Map the following ER diagram in relational schema

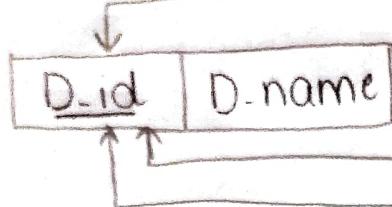


~~STUDENT~~

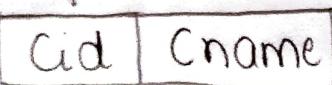
STUDENT :



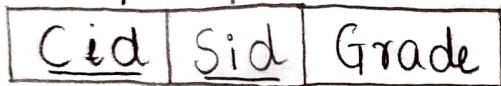
DEPARTMENT



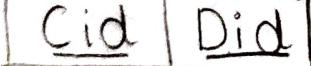
COURSES



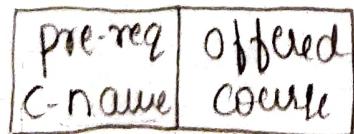
TAKING



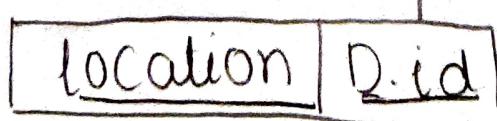
OFFERS



PRE-REQUISITES



LOCATION :



SQL JOINS

A cartesian product on 2 relations combines a tuple in first relation with every tuple in second relation.

- If R_1 has n_1 tuples and R_2 has n_2 tuples then cartesian product of R_1, R_2 i.e $R_1 \times R_2$ will have $n_1 * n_2$ tuples

- * An SQL Join combines info. from 2 or more tables i.e. It combines rows from 2 or more tables
- A Join is a means of combining field from 2 tables. by using values common to each.
- A Join operation is a combination of a cartesian product followed by a selection process with a condition specified.
- A Join works on 2 or more table if they have atleast one common field and have a relationship between them.

* Types of Join :

Operators used for joining tables

=, !=, <>, >, <, >=, <=, NOT, BETWEEN,
LIKE.

Most commonly used : '='.

Cartesian product is temporarily stored in
"temp" table

- Determine the id name and address of all customers who have placed some order distinct
- Select ^ id, name, address from customers, Order O where c.id = O.cid;

25-02-2020 :

* WORKING OF JOIN :

A

id	Name
1	XYZ
2	ABC
3	MNO
4	PQR

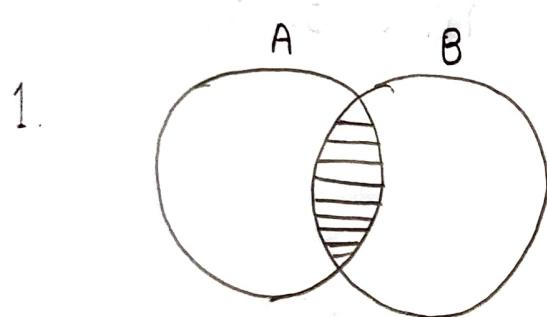
B

sid	did	dname
1	1	CSE
2	1	CSE
3	2	ECE
4	3	Mech

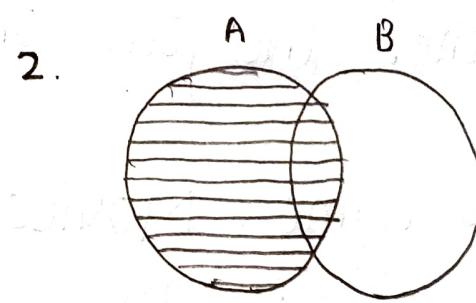
- 1) List the names of students along with the department she/he belongs to.
- Select name, dname from A, B where
A.id = B.sid ;

Types of Joins - Venn diagram.

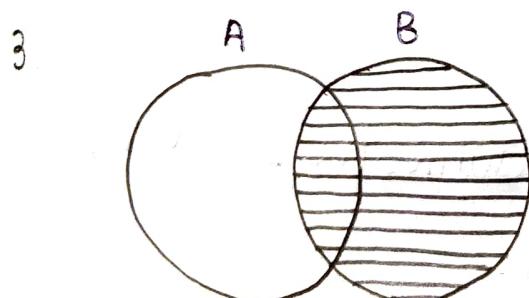
1. Inner Join
2. Left Join
3. Outer Right Join
4. Full Join.



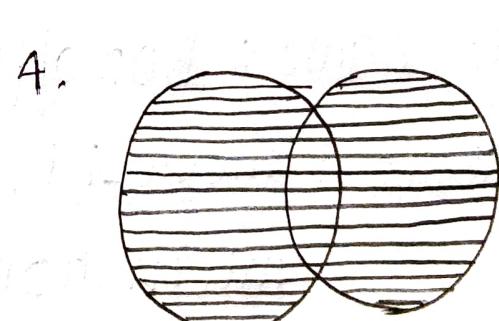
Inner Join



Left Join



Right Join



Full Join.

1. Combination of rows from A and B that satisfy the join condition
2. Select all rows from A along with rows from B for which the join condition is met (if at all).
3. Select all row from B along with rows from A for which the join condition is met (if at all)
4. Select all rows from A and B regardless of whether the join condition is met or not.

Table name : Movies.

Attribute : id, title, director, year, length - minutes

Table name : Boxoffice.

Attribute : movie_id, Rating, domestic_sales, international_sales.

1. Find the domestic and international sales for each movie.
 - Select title, domestic_sales, international_sales from movies m, BoxOffice B where m.id = B.movie_id
2. Show the sales numbers for each movie that did better internationally rather than domestically.
 - Select title, domestic_sales, international_sales from movies m, BoxOffice B where m.id = B.movie_id AND Domestic_sales < International_sales.
3. List all the movies by their ratings in the descending order.
 - Select title, rating from Movies m, BoxOffice B where m.id = B.movie_id
ORDER BY rating DESC;
1. OR Select title, domestic_sales, international_sales From movies JOIN BoxOffice ON movies.id = BoxOffice.movie_id;

Consider the following relational schema
and identify/write SQL queries for the same

table-name : pack-grades.

attributes - grade-id, grade-name, min-price,
max-price.

Packages : pack-id, speed, start-date,
monthly-payment, sector-id.

Customers : customer-id, fname, lname,
birth-date, join-date, state, main-phoneno
secondary-phoneno, fax, monthly-document,
pack-id.

Sectors : sector-id, sectorname.

23-2020

Nested Queries:

These are also called as subqueries, allowing to retrieve value from table whose rows satisfy where conditⁿ that depends on values returned by another select statement.

Syntax:

```
    select  
    from  
    where ( select ...  
            From ...  
            Where ... ) ; } Inner query.
```

- We can have atmost 16 nested queries. Regardless of no. of nested queries, the order of execution is always from the innermost query to outermost.
- Inner query must be included in a pair parenthesis. It appears at condition (where clause) of outer query.

Types of Nested Query

no. of rows returned



single
row



=, < >,

< , > ,

< = , > =

multiple row



IN

NOT IN

ALL

ANY

IN : Equal to any value retrieved in a sub query

NOT IN : Different than / not equal to any value retrieved in a subquery

ALL : Compare value to every value returned by a sub query

ANY : Compare value to ~~every~~ any value returned by a sub query

no. of correlated columns compared

single multiple

Eg: Consider the following schemas

S.Dept

<u>Id</u>	Name	Region.id

S.Emp

<u>Id</u> /Name	Mgr.Id	Title	<u>Dept-id</u>	salary

1. Display the name and salary of all emp. whose salary is greater than avg.salary
2. Display the name of dept. where there is atleast one employee
3. Select name, salary from S.Emp where
Salary > (select avg(salary) from S.Emp);

2. select name from s.Dept where dept
id In (select distinct dept-id from s.Emp);

3. List the names.id and the dept name ~~is of~~
~~all~~
~~which~~ employee.

Select d.name, e.id, s.①

Select e.name, e.id, d.name from s.Emp e,
s.Dept d where e.dept-id = d.id ;