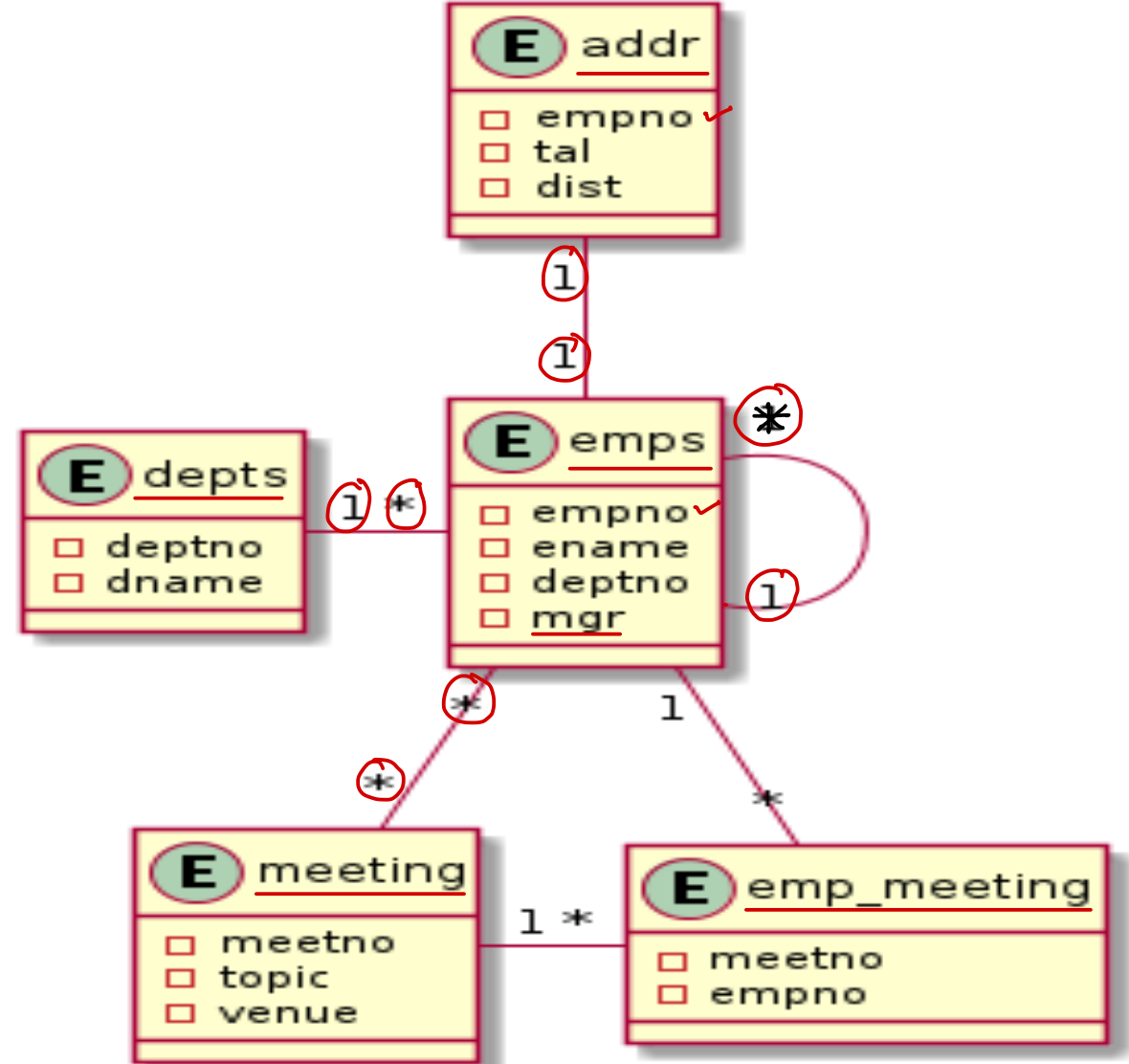# MySQL - RDBMS

Trainer: Mr. Nilesh Ghule

Entity Relations

- To avoid redundancy of the data, data should be organized into multiple tables so that tables are related to each other.

- The relations can be one of the following
  - One to One
  - One to Many
  - Many to One
  - Many to Many

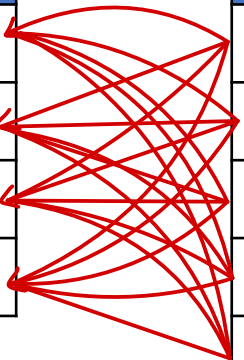- Entity relations is outcome of Normalization process.

SQL Joins

- Join statements are used to SELECT data from multiple tables using single query.
- Typical RDBMS supports following types of joins:
    - Cross Join
    - Inner Join
    - Left Outer Join
    - Right Outer Join
    - Full Outer Join
    - Self join
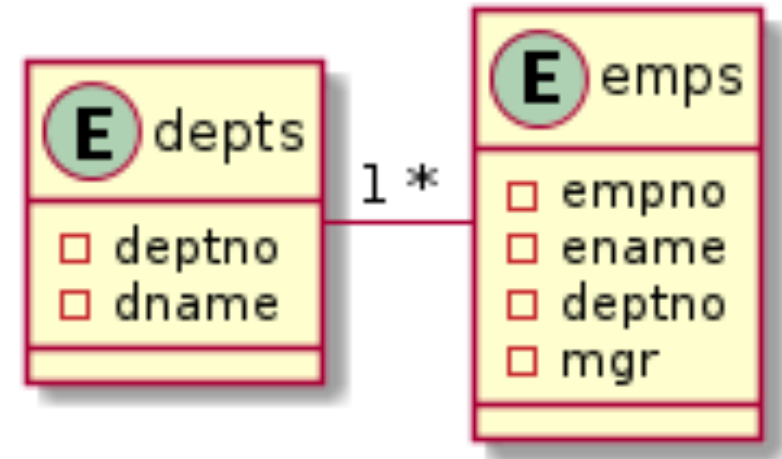
Cross Join

dept 4

deptno	dname
10	DEV
20	QA
30	OPS
40	ACC

emp 5

empno	ename
1	Amit
2	Rahul
3	Nilesh
4	Nitin
5	Sarang

for (Emp e: emp) {   driving table (outer loop)
    for (Dept d: dept) {   driven table (inner loop)
        print (e.ename, d.dname);
    }
}

3

3

Select e.ename, d.dname from
emps e cross join depts d;

- Compares each row of Table1 with every row of Table2.
- Yields all possible combinations of Table1 and Table2.
- In MySQL, The larger table is referred as "Driving Table", while smaller table is referred as "Driven Table". Each row of Driving table is combined with every row of Driven table.
- Cross join is the fastest join, because there is no condition check involved.
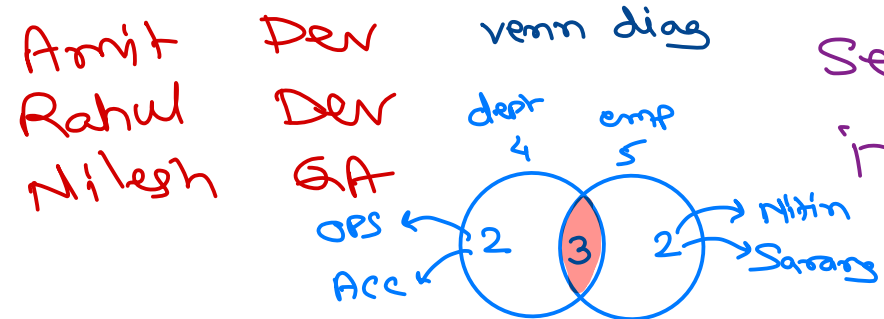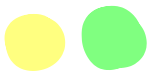
Inner Join

dept (4)

deptno	dname
10	DEV
20	QA
30	OPS
40	ACC

emp (5)

empno	ename	deptno
1	Amit	10
2	Rahul	10
3	Nilesh	20
4	Nitin	50
5	Sarang	50

for(Emp e: emp) {
  for(Dept d : dept) {
    if(e.deptno == d.deptno)
      print (e.ename, d.dname);

3

3   3

Amit   Dev
Rahul   Dev
Nilesh QA

venn diag

dept   emp
 4   5

OPS ← 2 (3) 2 → Nitin
Acc ←   → Sarang

Select e.ename, d.dname from emps e
inner join depts d ON e.deptno = d.deptno;

- The inner JOIN is used to return rows from both tables that satisfy the join condition.
- Non-matching rows from both tables are skipped.
- If join condition contains equality check, it is referred as equi-join; otherwise it is non-equi-join.

Left Outer Join

deptno	dname
10	DEV
20	QA
30	OPS
40	ACC
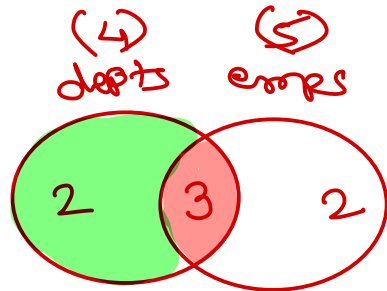
(4) depts   (5) emps

empno	ename	deptno
1	Amit	10
2	Rahul	10
3	Nilesh	20
4	Nitin	50
5	Sarang	50

2   3   2

select e.ename, d.dname
from depts d
left outer join emps e
on d.deptno = e.deptno;

for (Dept d : dept) {
  found = false;
  for (Emp e : emp) {
    if (e.deptno == d.deptno) {
      print (e.ename, d.dname)
      found = true;
    }
  }
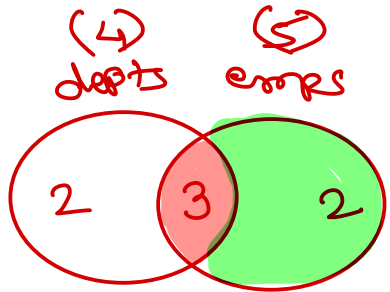 if (found == false)
    print (NULL, d.dname);
}

- Left outer join is used to return matching rows from both tables along with additional rows in left table.
- Corresponding to additional rows in left table, right table values are taken as NULL.
- OUTER keyword is optional.

Right Outer Join

deptno	dname
10	DEV
20	QA
30	OPS
40	ACC

empno	ename	deptno
1	Amit	10
2	Rahul	10
3	Nilesh	20
4	Nitin	50
5	Sarang	50

(4) depts (5) emps

2 3 2

Select e.ename, d.dname
from depts d
right outer join emps e
on d.deptno = e.deptno;

- Right outer join is used to return matching rows from both tables along with additional rows in right table.
- Corresponding to additional rows in right table, left table values are taken as NULL.
- OUTER keyword is optional.

Full Outer Join

deptno	dname
10	DEV
20	QA
30	OPS
40	ACC

empno	ename	deptno
1	Amit	10
2	Rahul	10
3	Nilesh	20
4	Nitin	50
5	Sarang	50

- Full join is used to return matching rows from both tables along with additional rows in both tables.
- Corresponding to additional rows in left or right table, opposite table values are taken as NULL.
- Full outer join is not supported in MySQL, but can be simulated using set operators.

Set operators

ename	dname
Amit	DEV
Rahul	DEV
Nilesh	QA
NULL	OPS
NULL	ACC

join1

ename	dname
Amit	DEV
Rahul	DEV
Nilesh	QA
Nitin	NULL
Sarang	NULL

join2

- UNION operator is used to combine results of two queries. The common data is taken only once. It can be used to simulate full outer join.

- UNION ALL operator is used to combine results of two queries. Common data is repeated.

Self Join

- When join is done on same table, then it is known as "Self Join". The both columns in condition belong to the same table.

- Self join may be an inner join or outer join.

empno	ename	deptno	mgr
1	Amit	10	4
2	Rahul	10	3
3	Nilesh	20	4
4	Nitin	50	5
5	Sarang	50	NULL

emps e

empno	ename	deptno
1	Amit	10
2	Rahul	10
3	Nilesh	20
4	Nitin	50
5	Sarang	50

emps m

select e.ename, m.ename from emps e
inner join emps m on e.mgr = m.empno;
select e.ename, m.ename from emps e
left join emps m on e.mgr = m.empno;

Multi-Table Joins

Thank you!

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