

No office hours today.

Join

```
Select Fname  
from Emp, Department  
where SSN = mgrSSN;
```

Inner Join

```
Select Fname  
From Emp INNER JOIN Department  
ON SSN = mgrSSN;
```

* Natural Join

```
Select Dname, Dlocation  
from Department NATURAL JOIN Dept-locations;
```

RENAME

```
Select Fname, Dependent  
from EMP NATURAL JOIN  
( Select ESSN AS SSN, Dependent-name AS Dependent  
From Dependent ) AS D;
```

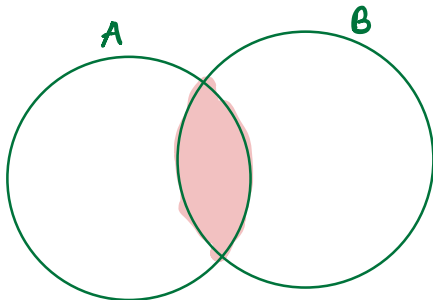
```
Select Fname, Dname  
from EMP NATURAL JOIN  
( Select Dname, Dnumber Dno
```

from Department where Dname = 'Research') D1 ;

Select Fname, Dname
from Emp NATURAL JOIN
(Select Dname, Dnumber Dno, mgr-SSN from Department) D2
where mgr-SSN = '8886' ;

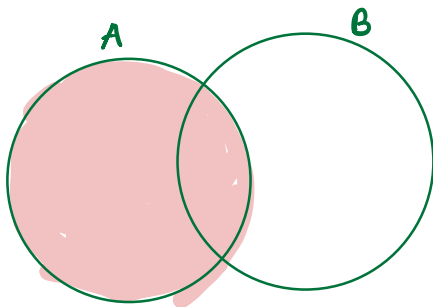
JOIN

{INNER} JOIN, \bowtie , * NATURAL JOIN
 \Rightarrow Left {Outer} JOIN
 \Leftarrow Right {Outer} JOIN
 \times Full {Outer} JOIN



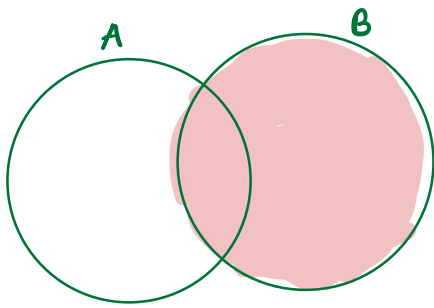
Select <>

from A {Inner} Join B
ON A.attr = B.attr

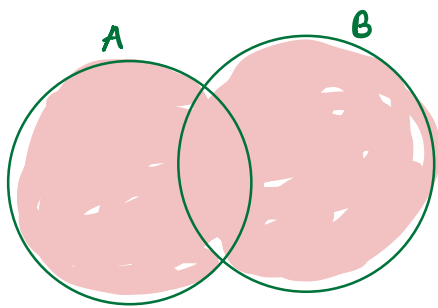


Select <>

from A left Join B
on A.attr = B.attr



Select <>
from A right join B
on A.attr = B.attr



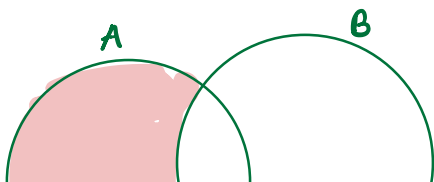
Select <>
from A full join B
on A.attr = B.attr

No full join in MySQL;

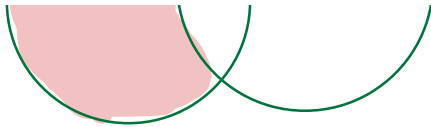
Select <>
from A left join B
on A.attr = B.attr

UNION

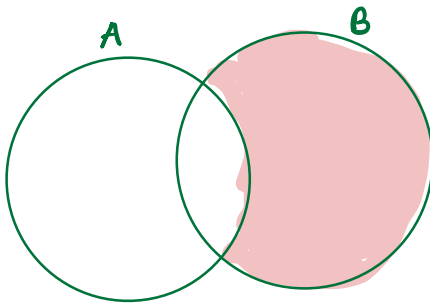
Select <>
from A Right join B
on A.attr = B.attr;



Select <>
from A left join B
on A.attr = B.attr



where B.altor IS NULL;

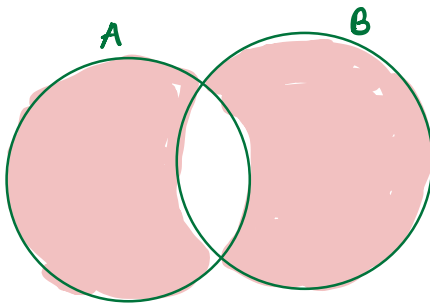


Select <>

from A right join B

on A.altor = B.altor

where A.altor IS NULL;



Select <>

from A full join B

on A.altor = B.altor

where A.altor IS NULL

OR

B.altor IS NULL;

Query: Select Fname
from Emp
where NOT exists

(Select * from Dependent where SSN = ESSN);

List emp without
dependents

Select Fname

from Emp left join Dependent

ON SSN = ESSN

where ESSN IS NULL;

VIEW - Virtual Tables

- * tables derived from base tables
- * views are not physically stored in the database.
- * the view table is generated on demand.
- * motivation: security; data needed frequently.

```
CREATE VIEW work (fname, lname, project, hours)
AS Select Fname, Lname, Pname, Hours
   from Emp JOIN Project JOIN works-on
   ON SSN = ESSN AND Pno = Pnumber;
```

* Queries on work

```
Select fname, hours
from work
where project = 'Product X';
```

* SHOW TABLES; will also show WORK

* Update base table \Rightarrow work is also updated

* Update work \Rightarrow base tables are also updated.

* DROP VIEW work;

Aggregate Functions