

-- 一

--1

```
select sNo,sName
from student
where age >= 20
```

--2

```
select sNo,sName,2022-age
from student
where sName like '钱%' and sex = '男'
```

--3

```
select cName
from course
where credit > 3
```

--4

```
select sName
from student
where dNo is null
```

--5

```
select dName
from department
where homepage is null
```

-- 二

--1

```
select dName,round(avg(age),2) as avg_age
from department,student
where student.dNo = department.dNo
group by department.dNo
```

--2

```
select student.sNo,sName,round(avg(score),2) as avg_score
```

```
from student,sc
where student.sNo = sc.sNo
group by student.sNo
```

--3

```
select course.cNo,cName,round(avg(score),2) as avg_score
from course,sc
where course.cNo = sc.cNo
group by course.cNo
```

--4

```
select dName,count(*) as courseNum
from course,department
where course.dNo = department.dNo
group by department.dNo
```

--5

```
select cName,count(*) as num
from course,sc
where course.cNo = sc.cNo
group by course.cNo
```

--三

--1

```
select sNo,sName
from student
where student.dNo = (select dNo
                     from department
                     where dName = '信息学院')
```

--2

```
select cNo,cName
from course
where course.dNo = (select dNo
                   from department
                   where dName = '软件学院')
```

--3

```
select sNo,sName
from student
where dNo in (select dNo
              from student
              where sName = '陈丽')
and sName != '陈丽'
```

--4

```
select sNo,sName
from student
where age in (select age
              from student
              where sName = '张三')
```

--5

```
select sNo,sName
from student
where age in (select age
              from student
              where sName = '张三')
and dNo not in (select dNo
                from student
                where sName = '张三')
```

--6

```
select cName
from course
where credit > (select credit
                from course
                where cName = '离散数学')
```

--7

```
select count(sNo)
from sc
where cNo = (select cNo
             from course
             where cName = '组合数学')
```

--8

```
select sName
from student
where student.sNo not in (select sNo
                           from sc
                           where cNo = (select cNo
                                         from course
                                         where cName = '离散数学'))
```

--9

```
select cName
from course
where credit not in (select credit
                     from course
                     where cName = '算法设计与分析' or cName = '移动计算')
```

--10

```
select cName
from course,sc
where course.cNo = sc.cNo
group by course.cNo
having avg(score) >= 90
```

```
select cName
from course
where cNo in (select cNo
              from sc
              group by cNo
              having avg(score) >= 80)
```

--11

```
select sName,score
from student,sc,course
where student.sNo = sc.sNo and sc.cNo = course.cNo
      and cName = '离散数学'
```

```
select sName,score
from student,sc
where student.sNo = sc.sNo and sc.cNo = (select cNo
```

```
from course
where cName = '离散数学')
```

--12

```
select cName,score
from course,sc,student
where student.sNo = sc.sNo and sc.cNo = course.cNo
      and sName = '王兵'
```

```
select distinct cName,score
from course,sc
where course.cNo = sc.cNo and sc.sNo in (select sNo
                                          from student
                                          where sName = '王兵')
```

--13

```
select distinct sName,cName,score
from student,course,sc
where student.sNo = sc.sNo and sc.cNo = course.cNo and score < 60
```

--14

```
select distinct sName
from student,sc,course
where student.sNo = sc.sNo and course.cNo = sc.cNo
      and course.dNo = (select dNo
                        from department
                        where dName = '文学院')

select sName
from student
where sNo in (select sNo
              from sc
              where cNo in (select cNo
                            from course
                            where dNo = (select dNo
                                          from department
                                          where dName = '文学院'))))
```

--15

```
select distinct sName,cName
from student,course,sc,department
where student.sNo = sc.sNo and course.cNo = sc.cNo
      and student.dNo in (select dNo
```

```

                                from department
                                where dName = '信息学院')
and course.dNo in (select dNo
                    from department
                    where dName = '信息学院')

select distinct sName,cName
from student,course,sc
where student.sNo = sc.sNo
      and sc.cNo = course.cNo
      and sc.sNo in (select student.sNo
                     from student
                     where dNo =(select dNo
                                   from department
                                   where dName = '信息学院'))
and sc.cNo in (select course.cNo
               from course
               where dNo = (select dNo
                             from department
                             where dName = '信息学院'))

```

--四

--1

```

select *
from student,course,sc
where student.sNo = sc.sNo and course.cNo = sc.cNo

```

--2

```

select cName
from course
where cNo in (select cPno
               from course
               where cName = '形式语言与自动机')

```

--3

```

select cName
from course
where cNo in (select cPno
               from course

```

--4

--5

--6

--7 两种写法

[illegible]

```

from course
where cName = '形式语言与自动机

'))

SELECT sName
FROM student
WHERE sNo NOT IN (
    SELECT sNo
    FROM sc
    WHERE cNo = (
        SELECT cNo
        FROM course
        WHERE cName = '形式语言与自动机'
    )
)

```

--8

```

select distinct sName
from student
where student.sNo in (select sNo
                      from sc
                      group by sc.sNo
                      having count(*) = 1)
and student.sNo in (select sNo
                    from sc,course
                    where sc.cNo = course.cNo and cName= '离散数学')

```

```

select sName
from student,sc
where student.sNo = sc.sNo and sc.sNo not in (select sNo
                                              from sc
                                              where cNo != (select cNo
                                                            from course
                                                            where cName = '高等数学'))

```

--9

```

select sName
from student
where student.sNo in (select sNo
                      from sc,course

```



```

                                where sc.cNo = course.cNo and course.cName = '形式语言
与自动机')
                                and student.sNo not in(select sNo
                                                        from sc,course
                                                        where sc.cNo = course.cNo
                                                            and course.cNo in (select cPno
                                                                from course
                                                                where cName = '形式语
言与自动机'))

```

--10

```

select sName,sum(credit)
from student,sc,course
where student.sNo = sc.sNo and sc.cNo = course.cNo
group by student.sNo
having sum(credit) >= 28

```

--11

```

select student.sNo,sName
from student,sc
where student.sNo = sc.sNo
group by student.sNo
having count(*) > 3 and min(score) > 85

```

--12

```

select student.sName
from student,sc
where student.sNo = sc.sNo
group by student.sNo
having count(*) = 3 and min(score) >= 60

```

--13

```

select dName,count(*)
from department,student
where student.dNo = department.dNo
group by department.dNo
having count(*) > 6

```

--14 两种写法

```

select sName
from student
where sNo in (select sNo
              from sc
              group by sNo
              having avg(score) > (select avg(score)
                                   from sc,student
                                   where sc.sNo = student.sNo and
student.sName = '王兵'))

```

```

select sName
from student,sc
where student.sNo = sc.sNo
group by student.sNo
having avg(score) > (select avg(score)
                    from sc
                    where sNo in (select sNo
                                   from student
                                   where sName = '王兵'))

```

--15

```

select sName
from student
where sNo in (select sNo
              from sc
              where cNo = (select cNo
                           from course
                           where cName = '离散数学'))
and sNo in (select sNo
            from sc
            where cNo = (select cNo
                           from course
                           where cName = '编译原理'))

```

--16

```

select avg(score)
from sc
where sNo in (select sNo
              from student
              where dNo = (select dNo

```

```

                                from department
                                where dName = '软件学院'))
and cNo = (select cNo
           from course
           where cName = '离散数学')

select round(avg(score),2) as avg_score
from sc
where sNo in (select sNo
              from student
              where dNo = (select dNo
                           from department
                           where dName = '软件学院'))
and cNo = (select cNo
           from course
           where cName = '离散数学')

```

--17

```

select sName,age,dName
from student,department
where student.dNo = department.dNo
and age != ALL(select age
               from student
               where dNo = (select dNo
                            from department
                            where dName = '软件学院'))

select sName,age,dName
from student,department
where student.dNo = department.dNo and age not in( select age
                                                    from student
                                                    where dNo = (select dNo
                                                                 from department
                                                                 where dName = '软件学院'))

```

--18

```

select cName,count(*),max(dName)
from course,department,sc
where sc.cNo = course.cNo and course.dNo = department.dNo
group by course.cNo
having count(*)>4

```

--19

```

select sName
from student,sc
where student.sNo = sc.sNo and sc.sNo not in (select sNo
                                             from sc
                                             where cNo != (select cNo
                                                            from course
                                                            where cName = '高等数
学'))

```

```

select sName
from student
where sNo in (select sNo
              from sc
              where cNo = (select cNo
                           from course
                           where cName = '高等数学'))
and sNo in(select sNo
           from sc
           group by sNo
           having count(*) = 1)

```

--20

```

select sName
from student,sc,course
where student.sNo = sc.sNo and course.cNo = sc.cNo
group by student.sNo
having (sum(credit*score)/sum(credit))<70

```

--21-1

```

select sName
from student
where not exists (select *
                  from course
                  where not exists (select *
                                    from sc
                                    where sc.sNo = student.sNo and sc.cNo =
course.cNo)
                  and dNo = (select dNo
                              from department
                              where dName = '信息学院'))

```

--21-2

```
select sName
from student
where not exists (select *
                  from course
                  where not exists(select *
                                  from sc
                                  where student.sNo = sc.sNo and course.cNo =
sc.cNo)
                  and cNo in(select cNo
                              from sc
                              where sNo in (select sNo
                                           from student
                                           where sName = '杨佳伟'))))
and student.sName != '杨佳伟'
```

```
SELECT sname
FROM student s
WHERE NOT EXISTS (
    SELECT *
    FROM sc sc2
    WHERE sc2.sno = (
        SELECT sno
        FROM student
        WHERE sname = '杨佳伟'
    )
    AND NOT EXISTS (
        SELECT *
        FROM sc sc3
        WHERE s.sno = sc3.sno
        AND sc2.cno = sc3.cno
    )
)
AND s.sname != '杨佳伟';
```

--五

--1

-- (1)

```
create table publisher(  
    p_no          varchar(20) not null unique,  
    p_name        varchar(100) not null,  
    p_address     varchar(100),  
    p_tel         varchar(20),  
    primary key(p_no)  
);
```

```
create table book(  
    b_no          varchar(20) not null unique,  
    b_name        varchar(100) not null,  
    b_author      varchar(50) not null,  
    b_ISBN        varchar(100) not null unique,  
    p_no          varchar(20),  
    b_version     varchar(20),  
    b_date        date,  
    primary key(b_no),  
    foreign key(p_no) references publisher(p_no)  
);
```

--(2)

```
drop table publisher cascade  
drop table book cascade
```

--(3)

```
create table publisher(  
    p_no          varchar(20) not null,  
    p_name        varchar(100) not null,  
    p_address     varchar(100),  
    p_tel         varchar(20)  
);
```

```
create table book(  
    b_no          varchar(20) not null,  
    b_name        varchar(100) not null,  
    b_author      varchar(50) not null,  
    b_ISBN        varchar(100) not null,  
    p_no          varchar(20),  
    b_version     varchar(20),  
    b_date        date  
);
```

```
alter table publisher add primary key(p_no)
alter table publisher add unique(p_no)
```

```
alter table book add primary key(b_no)
alter table book add unique(b_no)
alter table book add unique(b_IBSN)
alter table book foreign key(p_no) references publisher(p_no)
```

```
drop table publisher cascade
drop table book cascade
```

```
--2
insert
into publisher
values('01','西北工业大学出版社','西安','123')
```

```
insert
into publisher
values('02','高等教育出版社','西安','456')
```

```
insert
into book
values('01','高等数学','A','001','01','1.01',to_date('2001-01-08','yyyy-mm-dd'))
```

```
insert
into book
values('02','数据库系统概论','B','002','02','1.01',to_date('2010-11-11','yyyy-mm-dd'))
```

```
select *
from publisher
```

```
select *
from book
```

--3

```
update publisher
set p_address = '北京'
where p_no = '01'
```

--4

```
delete
from publisher cascade
```

```
delete  
from book cascade
```

--5

```
create view software_lisan  
as  
select student.sNo,student.sName  
from student  
where student.sNo in (select sNo  
                      from sc  
                      where sc.cNo = (select cNo  
                                     from course  
                                     where cName = '离散数学'))  
and student.dNo = (select dNo  
                  from department  
                  where dName = '软件学院')
```

```
insert  
into software_lisan  
values('123456','王五')
```

```
select *  
from software_lisan
```

```
select *  
from student
```

```
delete  
from student  
where sNo = '123456'
```

```
drop view software_lisan cascade
```

--6

```
create view avg_coursescore  
as  
select round(avg(score),2) as avg_coursescore  
from course left join sc on course.cNo = sc.cNo
```



```
where sc.score is not null
group by course.cNo
```

```
select *
from avg_coursescore
```

```
drop view avg_coursescore cascade
```

--7

```
create view avg_studentscore
as
select student.sNo,student.sName,round(avg(score), 2) as avg_studentscore
from student left join sc on student.sNo = sc.sNo
where sc.score is not null
group by student.sNo
```

```
select *
from avg_studentscore
```

```
drop view avg_studentscore cascade
```

--DCL

```
begin transaction;
    select *
    from student;
    select *
    from sc,course
    where sc.cNo = course.cNo;
    insert
    into student
    values('123456','ABC');
commit;
```

```
--rollback;
```

